Dental Abstracts

a selection of world dental literature

AMERICAN DENTAL ASSOCIATION

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SECTIONS

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Histology

Innervation of human dentin

Oskar Bock. *Deut.zahnärztl.Zschr.* 15:838-848
June 1, 1960

The distribution of nerves in human dentin was studied at the Dental School of the University of Erlangen, Germany.

Specimens of surgically removed completely or incompletely developed deciduous teeth and tooth germs from human fetuses (between the fourth and the ninth month of gestation) were decalcified and stained according to Bielschowsky's method, modified by Gross.

In the pulps and in tooth germs, nerve fibers were found which could be followed to the layers of the odontoblasts where they exhibited an extremely fine ramification (Fig. 1).

In the specimens of the completely developed deciduous teeth, nerve fibers were observed which had also entered the cells of the odontoblasts (Fig. 2A, B, C and D).

Isolated nerve fibers were detected in the soft fibrillar layers (predentin or dentinoid) which composed the primitive dentin and formed the internal substance of the circumpapular dentin

Figure 1 Innervation of the coronal pulp

(Fig. 3A, B and C). In the first third of the peripheral portion of the dentin adjacent to the enamel, argyrophil fibers were observed which were, or resembled, the long threadlike processes of the odontoblasts (Fig. 4).

The main part of the study consisted of histologic examinations of the minute structures, composition and function of the neurofibrils within the dentin layers. Previously, almost all authors studying the innervation of dentin described the course of the nerve fiber bundles from the roots to the coronal pulp. There the nerve fibers ramify, enter the layer of the odontoblasts and form a fine network. One of the many authors who observed this phenomenon was C. A. Baud who reported that he found the nerval network in the zone of the odontoblasts. In this layer, a direct connection between the nerve fibers and the cells of the odontoblasts can be established as well as

Figure 2 A: Nerve fiber entering the layer of an odontoblast. B: Nerve fiber surrounding an isolated odontoblast. C: Nerve fiber entering a cell of the odontoblast at its nucleus. D: Nerve fiber shows ramification after entering a cell of an odontoblast

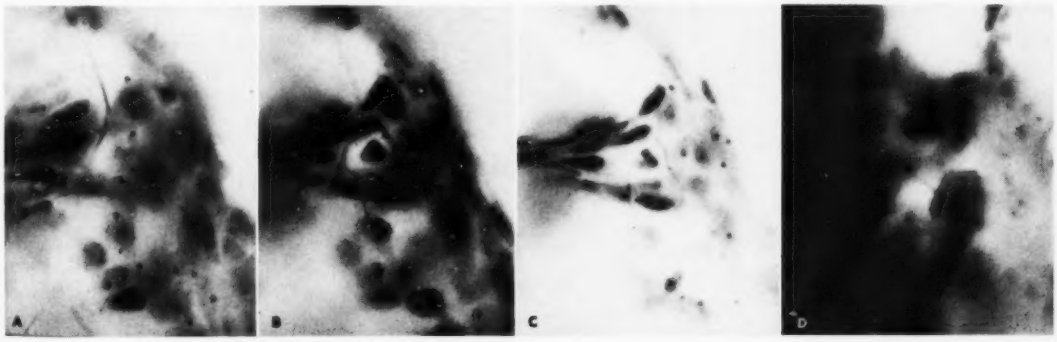
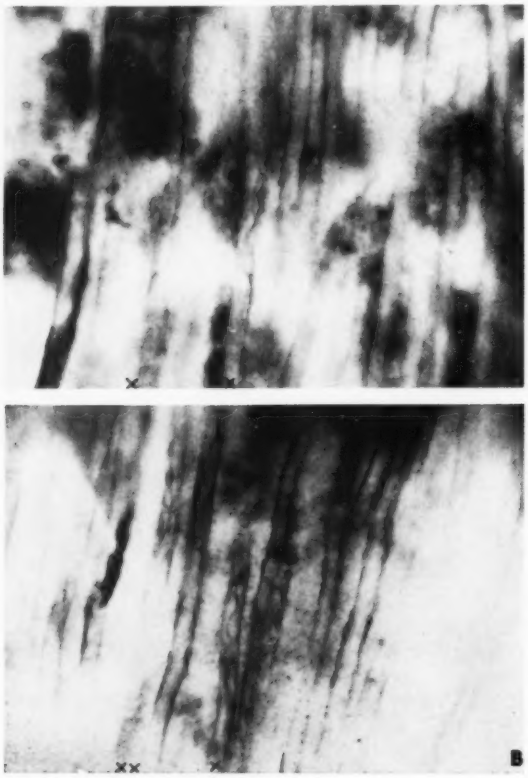


Figure 3 (Above) Ramification of a nerve fiber near one of Tomes' fibers. A: Contact between nerve fiber and Tomes' fiber. B: Reversal in the course of the fiber after contact with Tomes' fibers, forming a clubshaped callosity. C: The callosity proves to be a ramification

Figure 4 (Below) A: A fine network of nerve fibers appears in the dentinal canals (marked with X). B: Each dentinal canal marked with X contains only an isolated neurofibril. The canal marked XX contains several fibrils



a further connection with the branching processes of the odontoblasts (Tomes' fibers) in the dentinal canals.

Histologic examinations of the specimens revealed that sporadic nerve fibers pass through the layer of the odontoblasts and enter the predentin. There, these isolated fibers (not in the form of bundles) reverse their course before meeting the Tomes' fibers.

Dieck, Tojoda, Münch, Held and other authors reported that they found argyrophil fibers in the dentinal canals which they identified as being neurofibrils.

The result of the present investigation, however, does not confirm this theory because the microscopic pictures reveal that the entire process of the odontoblasts consists of a fine fibrillar structure. This observation was verified by R. M. Frank.

The confusing and erroneous conclusions, drawn by these authors, probably were based on the visualization of artifacts produced during the complicated staining process which indicated that some of the nerve fibers were enriched with ammoniacal silver.

In this phase of its evolution, the network of neurofibrils can be recognized only in the layer of the odontoblasts, and no argyrophil fibers can be found in either the dentin or the predentin.

How can this fact be brought into association with the sensitivity of dentin? Presuming that the few argyrophil fibers found in the dentin are actually neurofibrils, why are they observed only in the first third (or at most in the first half) of the peripheral portion of the dentin? Such an assumption cannot be reconciled with the often demonstrated fact that the region of the dentinoenamel junction is extremely sensitive. However,

no nerve fibers have been established at the junction of dentin and enamel. Therefore, there must be another possibility to explain the sensitivity of the region of the dentinoenamel junction. There seems to be a similarity between this phenomenon and the innervation of the auditory cells of the terminal acoustic apparatus within the scala media (organ of Corti). These auditory cells with their supporting elements (rods of Corti) can be compared in form and structure to the odontoblasts in dentin. It has been demonstrated that these auditory cells are highly sensitive. In these cells the physical stimuli are transformed into physiologic excitations. As yet, no one has established how such a transformation takes place. Morphologically, the auditory cells with their supporting elements and the odontoblasts with their threadlike processes are always to be found where such a transformation occurs. F. Sjöstrand's hypothesis explaining the transmission of light by stimulation of the optic nerve may contain an interpretation which is applicable to the transformation of stimuli to the region of the dentinoenamel junction. Although this hypothesis, as many other hypotheses, must be considered with caution, it presumes that the transmission of light takes place by monomolecular chains. Sjöstrand's conclusion was based on serial electromicroscopic studies. It can be imagined that a similar, monomolecular transmission may occur within the odontoblasts and their processes. In Tomes' fibers, such a monomolecular chain exists in a systematic state of rest in regard to the electric potential. If the end or a part of this chain comes in contact with a stimulant (electrolyte), a change in the electric potential occurs at this site. The stimulation of the monomolecule produces a correspondent change in all adjacent molecules. The disarrangement of the ions takes place within the odontoblasts and their processes. Histologic examinations have demonstrated that nerve fibers at the ends of the odontoblasts are positioned either intracellularly or are attached to the outer cellular walls. Therefore, any change of the electric potential within the odontoblasts or their processes can be transmitted to the fibers which have innervated the dentin.

Turnstrasse 5-7, Erlangen, Germany

Biochemical properties and physiological significance of the mast cells in oral tissue

R. Keller. *Schweiz.med.Wschr.* 90:503-508 May 7, 1960

Recent experimental investigations have revealed that the characteristic metachromatic granules of the mast cells in the oral tissues of humans and animals exhibit an amazing functional versatility. The accumulation, secretion and formation of heparin, a mucopolysaccharide acid having the property of prolonging the clotting time of blood by preventing conversion of prothrombin to thrombin, are centralized in these specific cell components. The major quantity of histamine in human and animal bodies appears to be formed and stored within these mast cells.

Although these biochemical properties of the mast cells in oral tissue have been determined in all the animal species investigated, the formation and storage of 5-hydroxytryptamine seems to be a specific property of the various species of the Rodentia.

Further examinations have demonstrated that in human and animal mast cells heparin and histamine are loosely bound together in the basophil granules; relatively small modifications in the permeability of the mucous membrane and in the ion exchange suffice to liberate the biochemical substances.

Under physiological conditions, the mast cells of the oral tissue are subject to cyclic alterations. If shock occurs brought about by dental procedures or other causative factors, the granules of the mast cells are ejected into the surrounding tissue in the form of an explosion, and many of the symptoms associated with shock are produced by the sudden release of the biochemical substances, especially histamine.

The physiological significance of mast cells—not only of those in the human oral tissue—still is obscure; the solution of this problem seems to be closely connected with the necessary determination of the physiological importance of heparin and histamine, especially in the connective tissue.

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Management of referred otalgia

Joseph Charles Elia. *J.Internat.Col.Surgeons* 33:446-456 April 1960

Pain in the ear generally is the result of a pathologic change occurring in the middle or the external ear or an involvement of the mastoid cells. Frequently, however, pain in the ear occurs when the afore-mentioned parts are normal. Referred otalgia is encountered frequently.

Of 141 patients with referred otalgia, the cause was traced to dental disturbances in 25 per cent; infection, 58 per cent, malignant change, 10 per cent, and miscellaneous, 7 per cent.

Otalgia of dental origin was traced to one of the following: pathologic conditions of the temporomandibular joint; dental caries; periodontal disease; fractured tooth with exposed pulp, or ill-fitting dentures. More than half of the patients with otalgia referred to dental causes had pathologic conditions of the temporomandibular joint; 83 per cent of such patients were women.

When the temporomandibular joint was the source of referred pain, the patient often learned to chew on the opposite side of the mouth to relieve the pain. A few patients, however, had more violent pain when they chewed on the opposite side of the mouth than when they employed the side where the pain originally occurred. Ten patients were treated by intra-articular injections of hydrocortisone, and 11 were referred to their dentists for correction of the occlusion; one patient was referred for modification of his denture.

Pain in the ear associated with dental deficiencies is due to reflexes set up in the auricular temporal nerve, a branch of the mandibular division of the trigeminal nerve.

Referred otalgia in 82 patients (58 per cent) was traced to infection. In order of frequency, the infections noted as causes of referred otalgia were lingual tonsillitis, palatine tonsillitis, acute cervical adenitis, acute purulent maxillary sinusitis, acute laryngitis, acute adenoiditis, acute pharyngitis and acute parotitis. Infections were treated with sulfadimethoxine, with gratifying results. No untoward reactions were encountered.

Malignant disease of the tongue, tonsil, larynx or pharynx was responsible for referred otalgia in 10 per cent of the 141 patients.

Miscellaneous causes for referred otalgia in eight patients included trigeminal neuralgia, herpetic involvement of the geniculate ganglion, allergy, and epistaxis.

275 Hill Street, Reno, Nev.

Bleeding due to deficiency of plasma thromboplastin antecedent (PTA) and plasma thromboplastin component (PTC): report of nine cases

Ronald F. Steg, Robert J. Gores, John H. Thompson, Jr., and Charles A. Owen, Jr. *Oral Surg., Oral Med.& Oral Path.* 13:671-677 June 1960

A study was made of nine patients with deficiency of either plasma thromboplastin antecedent (PTA) or plasma thromboplastin component (PTC) who underwent oral surgical intervention at the Mayo Clinic. Five of the patients had PTC deficiency (Christmas disease) and four had deficiences of the PTA type. Five of the patients were known preoperatively to have a hemophiloid disease. Only two of the patients had family histories of any bleeding tendency, but eight of the nine patients had personal histories of various episodes of bleeding after surgical procedures or trauma.

The five patients who had preoperative diagnoses of hemophiloid states received transfusions of whole blood prior to operation. Three of the five patients had no postoperative bleeding problems, one had slight hemorrhage seven days after operation which stopped spontaneously without additional treatment, and the remaining patient had slight continuous oozing from the operative site during the immediate postoperative period, with development of a hematoma. This complication probably resulted from the fact that the remaining lower teeth traumatized the upper ridge while the patient ate or slept. An acrylic maxil-

lary bite splint was fabricated for the patient, the hematoma was removed, and the splint put in place for seven days, being removed only for eating (liquid diet) and cleaning. The wound healed uneventfully.

In the four patients in whom no preoperative diagnosis of a hemophiloid disease was made, the development of postoperative bleeding led to coagulation studies. One patient required a transfusion of whole blood before postoperative bleeding was arrested. Pressure packs and suturing controlled the bleeding in the other three patients.

The past medical history is extremely important in the recognition of a possible hemorrhagic disorder. If a clotting defect is found to be caused by lack of PTC or PTA, preoperative preparation by transfusion of whole blood or plasma appears to be justified.

Mayo Clinic, Rochester, Minn.

The problem of diabetes mellitus in dental practice

E. Cheraskin. *J.D.Med.* 15:67-79
April 1960

There are 1,000,000 known diabetic patients and another 4,000,000 persons now living in the United States who probably will develop diabetes mellitus. About 1 of every 32 patients who enter the dental office either has diabetes mellitus or has a predisposition for the disease. Four means are available to the practitioner to detect diabetes mellitus: (1) the patient's history, (2) clinical examination, (3) roentgenographic examination, and (4) laboratory tests.

By means of the history, clinical and roentgenographic examinations, the practitioner can only suspect diabetes mellitus. Symptoms may be observable only in the more advanced stages of the disease. Neither the oral nor the general complaints are pathognomonic; the same symptoms may be associated with other metabolic or nonmetabolic disorders. In instances of early and mild diabetes mell.tus, the history may be completely negative. In brief, a diabetic patient may have no oral or general symptoms to indicate the presence of diabetes mellitus.

Among the oral findings associated with diabetes mellitus are oral pain, dryness of the mouth, coating of the tongue, marginal lingual indentations, diffuse erythema of the oral mucosa, gingival erythema and enlargement, loss of gingival stippling, gingival bleeding, rapid deposition of calculus, spontaneous pulpitis, parietal root abscesses, loose teeth, spontaneous exfoliation of teeth, and frequent occurrence of dry socket.

An increase in bone destruction or a decrease in bone formation produces a pathologic roentgenographic pattern in the more advanced stages of diabetes mellitus, but the roentgenographic picture in the diabetic patient is not specific.

Confirmation of the presence of diabetes mellitus is possible only through laboratory tests. The presence of glycosuria may be regarded as evidence of diabetes mellitus. However, the absence of sugar in the urine cannot be interpreted as evidence that the patient is not diabetic. The most reliable, practical, clinically adaptable laboratory tool is the glucose tolerance test.

In a study of 43 diabetic and prediabetic patients at the University of Alabama School of Dentistry, only five of the patients knew that they were diabetic. Each patient was examined by means of a glucose tolerance test. Only 1 of the 43 patients (2.3 per cent) had glycosuria.

Several different types of glucose tolerance tests are employed. The most favored test consists of taking a fasting blood sugar sample and urinalysis, then supplying the patient with 100 Gm. of glucose orally. Exactly one half, one, two and three hours later, blood samples and urine are examined for the presence of sugar to determine how well the patient can handle this experimental load. Although the criteria for a normal glucose tolerance test still are not determined, a blood sugar of 170 mg. per cent at the peak of the curve in the one-hour sample, or failure of the blood sugar to return to normal in the two-hour sample, is at least presumptive evidence of diabetes mellitus.

Four cases are reported, each emphasizing a point in the detection of diabetes mellitus at the dental office.

University of Alabama Medical Center, Birmingham, Ala.

Anatomy

Diastemas

J. G. de Boer. *Tschr.tandheelk.* 67:87-99
Feb. 1960

In contrast to the normal human dentition, the dentition in several animal species exhibits characteristic spaces between the canines and the posterior teeth, especially in the lower jaw. These diastemas have been caused by different etiologic factors, the most common origin being an evolutionary overdevelopment of the lower jaw. Diastemas in the animal dentition may be distributed evenly throughout the dental arches (as in toothed whales) or occur in specific tooth groups only (as between the premolars in several species of *Carnivora*).

Intensive masticatory function requires vehement interdental contacts, at least within certain tooth groups. These tooth groups are characterized either by large diastemas (as in herbivorous animals such as horses and ruminants) or by smaller diastemas between the anterior and posterior teeth (as in rodents). In rodents, the evolutionary continuous reduction in the size of the teeth and the simultaneous elongation of the jaws played an important part in the etiologic development of diastemas.

In other animal species, however, diastemas are often associated with an excessive development or a diverging position of one or two tooth types such as in the hedgehog, *Erinaceus europaeus* (Fig. 1), or in the lemur, *Lemuroidea macaco* (Fig. 2).

In other animal species, the canines have developed into fangs or tusks. This evolutionary process required the development of premaxillary diastemas to accommodate the lower canines as in carnivorous animals (Fig. 3) or in apes and monkeys (Fig. 4).

In man, however, the cuspids are about as large (in height) as the other teeth and, therefore, there exists no necessity for development of premaxillary diastemas in the permanent dentition. In certain species of prehistoric *Hominidae*, especially in *Pithecanthropus robustus* (Fig. 5), diastemas have been observed.

Figure 1 Large diastema between the central incisors in the hedgehog

Postcanine diastema in the lower jaw has often been considered as an equivalent of premaxillary diastema. However, the upper teeth bite and chew outside of the lower dental arch, and the postcanine diastema in the lower jaw is not required to accommodate the upper fanglike ca-

Figure 2 Postcanine and precanine diastema in the lemur

nines. Diastemas may develop to compensate for the considerable mesiodistal dimension of the upper canines, so that the first upper and lower premolars will maintain their proper relations. Fanglike canines may injure the mucosa in lower diastemas or may cause excessive attrition of the smaller adjacent or opposite teeth. Nature, however, has prevented such injuries by specific evolutionary developments. In carnivorous animals, for instance, the lateral jaw movements are limited by the presence and function of the carnassial teeth (Fig. 3), or by crossing of the upper and lower fanglike canines. The development of preglenoid processes restricts the lateral movements of the mandible, thereby preventing the contralateral condyles from moving in a forward direction. In young carnivorous animals,

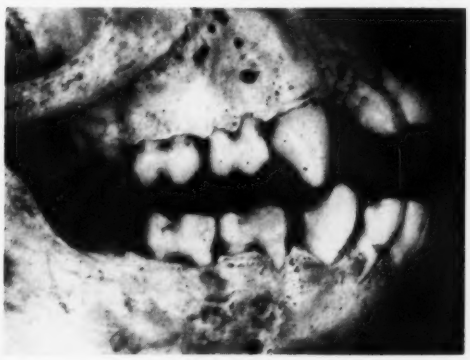
Figure 3 Carnassial teeth and preglenoid processes in the cat

Figure 4 Incisal divergence of incisors and canines in the Old World monkey

Figure 5 Diastemas in Pithecanthropus robustus. *The mandible probably is that of* Pithecanthropus erectus

Figure 6 Postcanine diastemas in the baboon

Figure 7 Premaxillary and postcanine diastemas in the deciduous dentition of the Old World monkey



however, preglenoid processes are not present; the comparatively small deciduous canines render the formation of preglenoid processes superfluous. These processes develop after the deciduous teeth have been shed.

In species of the *Suidae* family (domestic and wild swine), the tusks are harmless to gingival tissue and tooth structure because of the tusks' form and position; no preglenoid processes have developed in swine.

In species of the *Tayassuidea* family (peccaries), vertically positioned tusks have developed which could cause injuries during lateral jaw movements; these movements are restricted by the presence of preglenoid processes.

In species of the *Simiidae* family (chimpanzee, gorilla and orangutan), postcanine diastemas are reduced by an excessive development of the lower first premolars in a mesiobuccal direction. The lateral mandibular movements are limited by the articulation between the lower premolars and the upper fanglike canines; injuries to the oral mucosa within the diastemas and an excessive attrition of the upper lateral incisors are thereby prevented.

In carnivorous animals, the incisors and canines lie parallel to each other, whereas in the anthropoid apes these teeth diverge incisally. The presence of large premaxillary diastemas in the apes is associated with the presence of small precanine diastemas in the mandible (Fig. 4 and 6). A similar phenomenon has been observed in the fossil remains of *Pithecanthropus robustus*.

The deciduous dentition of the Old World monkeys exhibits premaxillary, precanine and postcanine diastemas (Fig. 7). L. J. Baume (1950), called attention to the occasional occurrence of premaxillary and postcuspid diastemas in the human deciduous dentition. In such instances, a neutroclusion of the first permanent molars developed, probably resulting from the movements of the lower deciduous molars which had been pushed forward by the erupting lower permanent molars. In the completed permanent dentition, the width of the postcuspid diastemas is gradually decreased.

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Stereomicroscopic study of 700 root apices of maxillary and mandibular posterior teeth

David Green. *Oral Surg.,Oral Med.& Oral Path.* 13:728-733 June 1960

This study of 700 root apexes of maxillary and mandibular posterior teeth was undertaken to establish with greater precision than has heretofore been attained the morphology of the canal at the root apex, the major apical foramens, and accessory apical foramens.

Specimens were treated and prepared carefully so as not to mar the natural details. The specimen apexes were cut at a point 7 mm. distance from the apex and cemented, flat end down, on glass microscopic slides. The apexes then were studied under a three-dimensional microscope, which had a measuring device on the lens.

Average accessory foramens are about half the size of major foramens and twice the distance from the apex.

About 50 per cent of the major foramens open directly at the apex. Those which do not open at the apex range from eccentric position to 2 mm. from the apex.

The average funnel in an apical foramen diminishes in diameter to about half its maximum value at a point about 0.75 mm. from the surface opening.

When a curve was noted at the root end, the canal invariably followed the curve rather than a straight line.

In multirooted teeth, whether or not accessary foramens were present, the other roots usually had similar conditions.

About 25 per cent of the maxillary first bicuspids and about 10 per cent of the maxillary second bicuspids had two fully formed roots. In mandibular bicuspids, the occurrence of two roots is rare.

This study supplements a previous stereomicroscopic study of the root apexes of 400 maxillary and mandibular anterior teeth (1956). A further study of double canals in single roots is in preparation.

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Education

Dental Institute of the Karl Marx University of Leipzig, Germany

R. Kleeberg. *Deut.Stomat.* 10:89-92 Feb. 1960

Dental education at the University of Leipzig, which was created in 1409 and renamed Karl Marx University in 1952, began on an extremely small scale without the benefit of a precedent in 1884. The excellence of the present dental school in Leipzig, therefore, is due to the wisdom, foresight, ingenuity and ability of many devoted dental administrators and educators.

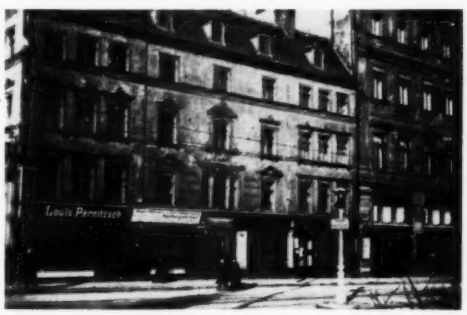

Figure 1 The old school building (1884-1910)

In 1884, the first dean of the Dental Institute, Friedrich Luis Hesse, taught dentistry to only seven students at the old building at Goethestrasse 5 (Fig. 1). Since that time, the history of the institute typifies the evolution of the dental curriculum from its early type to the present high level.

Professor Hesse emphasized the high standards in dental education in the United States, which he had studied at the dental schools in New York, Boston and Philadelphia. Although Hesse died before his educational program was completed, at the time of his death (1906) modern dentistry was taught to 44 students.

Figure 2 The first new building (destroyed in 1943)

Hesse's two successors, Professor Dependorf and Professor Pfaff, arranged the new dental curriculum, educational methods and the type of diploma (DR.MED.DENT.) awarded.

In 1910, a new school building (Fig. 2) was erected which facilitated dental education for 100 students. In 1915, during World War I, Dependorf was killed on the battlefield of Flanders. Professor Pfaff headed the institute from 1915 to 1919. As were most other dental schools in Germany, the institute was used during the war as a military hospital, especially for soldiers with wounds involving the maxillofacial region. Wolfgang Rosenthal, one of the first oral surgeons in Germany, headed the hospital.

In 1919, Professor Oskar Römer became dean of the institute. He initiated the first courses on dental research and histology as parts of the curriculum. In 1928, Römer became President (*Rektor*) of the University of Leipzig. He was

Figure 3 The present school building

the first German dentist to obtain such a distinction.

Römer resigned in 1934 as the dean of the institute, and was succeeded by Professor Hauenstein. Even though the requirements for admission to the dental institute were raised rapidly, there was no decrease in the number of students. Hauenstein enhanced the opportunities in dental education by improving the curriculum and by establishing a postgraduate school for dental practitioners and an oral surgery clinic with 37 (today 50) beds. The first dental internship in Germany arose from this clinic.

In 1936, Professor Erwin Reichenbach (at present the dean of the Dental School of the University of Halle/Saale), became Hauenstein's successor. During World War II (in December 1943), the school building was almost completely destroyed by the Royal Air Force.

The present school building (Fig. 3) was erected and occupied in 1952. Its architectural style is outstanding, probably the finest in Germany. The building facilitated a rapid development of the dental school under the present dean, the author. An important feature of the school is the dental library. Previously, the members of the faculty and the students had to depend on their own—often inadequate—collections of dental textbooks and journals. The dental library now contains the finest and most complete exhibition of dental books and documents in Europe.

The complete story of the Dental Institute of the Karl Marx University of Leipzig cannot be told because great educational institutions are never quiescent; changes are being made continuously as new developments appear.

The progress made in dental education can be visualized by the number of students (at present 300) attending the institute, and by the expansion program now underway which will increase this number by 50 per cent.

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Public health dentistry

Fluorine for caries prevention in Hesse, Germany

G. Wrzodek. *Zahnärztl.Welt & Reform* 61:136-318 March 10, 1960

The drinking water in most communities of Hesse has an average fluorine content of 0.2 ppm.

At present three different procedures have been initiated to provide a fluorine (fluoride ion) intake sufficient to prevent a further increase in the incidence of caries: (1) fluoridation of the water supplies of the city of Kassel; (2) administration of tablets containing fluorine to school children by the German Society for School Dentistry, and (3) administration of sweetmeats (dragées) containing fluorine to preschool and school children of several urban and rural districts by the state government (Public Health Authority) of Hesse.

To investigate the effect of the three procedures, two groups were formed: (1) the fluorine group consisting of children receiving fluoride, and (2) the control group consisting of children (of the same ages and sexes) receiving no fluoride and serving as controls.

Prior to the initiation of the caries-preventive measures, the children in both groups underwent thorough dental and oral examinations, and the findings were recorded on individual dental charts. Based on the results of the examinations, the values of caries incidence and intensity were determined independently for both groups. The difference between the DMF index values revealed the intensity of the caries frequency and activity in both groups.

There was no statistically significant difference in caries distribution between the groups prior to the initiation of the caries-preventive measures, either in regard to age or sex.

After an observation period of from three to four years, the average incidence of new cavities in the fluorine group was significantly reduced (from 44.4 per cent to 18.9 per cent). The investigation of the effect of fluorine on the permanent

dentition of the children of Hesse, however, will yield definite results only after a longer observation period (at least ten years), so that conclusions can be based on demonstrable evidence.

As yet, no toxic effects and no endemic dental fluorosis have been observed by the examining dentists and physicians.

All three caries-preventive methods are easily applicable, although the fluoridation of the water supplies appears to be easier to regulate and to control. Administration of fluorine in the form of tablets or dragées, however, seems to be less expensive but requires close cooperation between physicians, dentists, teachers and parents. Both procedures carry the risk of overdosage or underdosage.

Among the numerous caries-preventive methods, the fluoridation of drinking water seems to be the most promising, most effective, most practicable and safest prophylactic procedure and dental health measure, although the problem of dental caries cannot be solved only by administration of fluorine.

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Dental caries and periodontal disease

Friedrich Wilhelm Proell. *Quintessenz* 11:69-70 March 1960

Dental caries and periodontal disease seem to exhibit, at least clinically, certain antagonistic tendencies. Teeth affected by periodontitis or periodontosis usually possess extremely hard enamel surfaces and are, therefore, resistant to caries. Periodontal disease and caries seldom occur simultaneously in the same tooth.

Etiologically, however, caries and periodontal disease have many things in common. Heredity, susceptibility and general health condition play important parts in the development of both diseases. Environmental factors, especially a deficient nutrition and a neglect of oral hygiene, contribute much to the increase in the incidence of caries and periodontal disease. The actions of microorganisms within and without the oral cavity can be regarded only as secondary factors.

The course of periodontal disease depends mainly on the age of the patient, the state of his metabolism and the presence of unfavorable forces and stresses. In contrast to caries, periodontal disease cannot be considered as being a "civilization" disease, because it occurred in ancient man and appears in recent primitive people and in various animal species.

Disturbances in the autonomic (vegetative) nervous system seem to influence significantly the pathologic course of all forms of periodontal disease. Protraction of the jaw, usually caused by thumbsucking or other undesirable habits of children, often is accompanied by serious defects in calcification of the alveolar bone and by a progressive degeneration of the periodontium. Many investigators have observed that in primitive people the thumbsucking habit did not influence the position or mobility of the teeth or the condition of the periodontal tissues. The resistance to periodontal disease, observed frequently in the aborigines of Africa, Asia and Australia, seems to be related to their more natural diet (poor in sugar but rich in fluorine-containing fish).

In modern man, the increasing susceptibility to caries obviously is promoted by hereditary factors, disturbances in development and growth during the prenatal and early postnatal periods, defects in formation and calcification of the hard tooth tissues, as well as by exogenous factors such as avitaminoses and other deficiency diseases.

The idiopathy of caries, however, is caused not only by hereditary or acquired defects in enamel or dentin structure but by an unfavorable environment (general and oral) and by nutritional deficiencies. Several investigators have demonstrated that the incidence of caries is comparatively low in geographical regions in which the drinking water contains an adequate amount of fluorine (from 0.8 to 1.2 ppm). Caries-preventive procedures, therefore, should be initiated immediately whether consisting in the fluoridation of community water supplies, topical application of fluorine solutions, or administration (adequately controlled) of fluorine tablets, and the addition of protein, vitamins, and the salts of calcium and phosporus to the diet of children and pregnant women.

The recommendation of these measures to reduce the incidence of caries is based on the results of numerous experiments carried out with human subjects and various animal species.

Unquestionably, caries and periodontal disease still are increasing because they are sequelae of modern man's unnatural way of life. He does not get enough sunlight, exercises insufficiently to keep the organs and functions of his body in a healthy condition, and he craves refined food which often contains too much sugar but lacks the essential minerals and vitamins.

The majority of married women are now working, thereby neglecting not only the training but also the general care and oral hygiene of their growing children. Irreparable damages probably have been inflicted to the embryos during pregnancy.

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What motivates children to practice good oral hygiene?

Nancy J. Dudding and Joseph C. Muhler. *J.Periodont.* 31:141-142 April 1960

The question, "Where did you learn to brush your teeth?" was asked of 374 children ranging in age from 6 to 14 years, all residing in Bloomington, Ind. Earlier, each child had been classified as having either "good" or "poor" oral hygiene, based on oral examination.

Of the children classified as having good oral hygiene, 61 per cent said they learned oral hygiene practices from a dentist; 4 per cent, hygienists; 19 per cent, parents; 2 per cent, television; 6 per cent, school, and 8 per cent said they didn't know.

Of the children classified as having poor oral hygiene, 33 per cent said they learned oral hygiene practices from a dentist; 11 per cent, from hygienists; 4 per cent, parents, 15 per cent, television; 0 per cent, school, and 37 per cent said they didn't know.

The results provide proof of the dentist's influence on the practice of good oral hygiene habits by children. When the dentist spends some time with the child in teaching him how and when to clean his teeth, the child will respond by having a clean mouth.

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Dental research in the public health service

D. H. Goose. *Pub.Health* 74:185-190 Feb. 1960

Although in Great Britain little research has been developed within the public dental health service, dental research is a necessary and integral part of such a service. The incidence of dental disease in the entire country is increasing enormously, and the traditional treatment methods used are inadequate to cope with the problem. Any research which may promote the development of preventive measures would play a significant part in the public dental health service.

The public dental health officer is advantageously placed to conduct research work. Usually he has several thousand children under his care, and has access to all their records including their medical histories. He deals with a cross section of the population and not only with a comparatively small sample which may lead to biased conclusions. The public dental health officer is used to thinking in statistical terms.

Among the possible research problems requiring immediate attention are the following: (1) the incidence of dental caries in different population groups; for example, those residing in rural and urban communities or in northern and southern districts; and the caries incidence among Jamaicans, Indians and other foreigners now living in Great Britain; (2) the incidence of malocclusion in town and country populations and its causes; (3) the value of tooth extraction for correction of malocclusion, and (4) the development and assessment of dental health education methods.

Recent examples of dental research carried out in public health departments include a comparative study of the incidence of periodontal disease in children with different breathing habits (open and closed lips); a test to evaluate the efficiency of a tooth paste containing a high amount of urea ammonia, and a study of the relation between the muscular activity in chewing and the tongue movements in cleansing the mouth after eating.

Northamptonshire County Council, Northampton, England

Figure 1 Rat skull and mandible cleaned by dermestid beetles

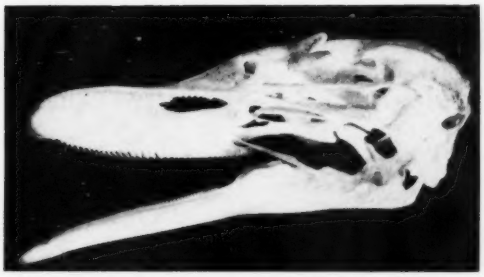

Figure 2 Duck skull and mandible cleaned by dermestid beetles. The horny plates were not attacked by the beetles

General

The dermestid beetle method of skull preparation

B. J. Kruger. *Univ.Queensland,Papers, Dept.Den.* 1:29-32 Jan. 1960

In the preparation of a skull of an experimental animal for the examination of dental caries, the usual practice is to dissect the soft tissues, separate the mandible from the rest of the skull, and preserve the specimen in 10 per cent Formalin (formaldehyde solution). Both the preparation and the subsequent examination of wet specimens under a binocular microscope are messy and time consuming.

The purpose of this article is to redirect attention to the suggestion of Klapper (1954) that dermestid beetles be used to clean skulls. The beetle, *Dermestes maculatus Degeer,* is widely distributed throughout the world. It has a number of common names: leather beetle (America), skin beetle (South Africa) and larder beetle (Australia). About one dozen adult beetles are needed to start a colony.

At the University of Queensland Department of Dentistry, the beetle colony is housed in a wooden box (14 by 10 by 7 inches) lined with tin. The box has a tightly fitting lid with a 9 by 7 inch insert of the finest flyproof gauze. The interior of the box is enameled black to provide a minimum of light. About one inch of pine shavings is placed in the bottom of the box to protect the larvae.

When an experiment has been completed and the animals sacrificed, each decapitated head is skinned and identified by litigating a punched metal disk through the zygomatic arch. Each skull is placed in an individual compartment in a copper gauze container to keep the mandible with its corresponding skull after cleaning by the beetles. A thriving colony with some hundreds of beetles at various stages of the life cycle can clean 36 rat skulls in from 48 to 72 hours.

Klapper had suggested that refrigerated skulls be submitted to dry heat (50° to 60°C.) for several hours before being introduced to the beetles. In the author's laboratory, this was found to be necessary in the initial stages of building up the colony and when using refrigerated skulls, but unnecessary when the colony is thriving. When there are no skulls to be cleaned, the beetles can be maintained with meat and bone.

Klapper suggested that the skull, after cleaning, be degreased in dilute ammonium hydroxide for 12 hours, washed in running water for several hours, and dried. This method has proven satisfactory, but a quicker method is to bleach the skulls in 30 volumes of hydrogen peroxide for several minutes, wash in running water and dry. The skulls then can be numbered with marking ink and filed in boxes.

Figures 1 and 2 show skulls and mandibles cleaned by beetles.

The dermestid beetle method is more suitable than other technics for preparing skulls for dental caries evaluation, for the following reasons:

1. The skulls are cleaner and can be more easily branded and more conveniently stored.

2. The teeth remain firmly in their sockets, which makes for easier and more accurate grinding of successive planes.

3. The examination for caries is more easily performed because the tooth surfaces are dry and relatively free of debris.

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Clinical evaluation of cleft palate patients and their speech

Alan R. Vini Coff. *Plast.& Reconstr.Surg.* 25:496-502 May 1960

The desired goal in the treatment of patients with cleft palate is to obtain normal speech, and if this result is not achieved, the therapy is incomplete. The literature dealing with cleft palate therapy is sprinkled with subjective descriptions of speech. A knowledge of normal speech mechanisms provides a foundation for a better understanding of abnormal speech, which in turn can eliminate much of the guesswork and supposition encountered in cleft palate therapy.

Normal speech may be considered as that which is consistent with the age of the patient and in conformity with the average of his environment. Production of speech is a complex operation involving the simultaneous interaction of the following factors: a column of air, a functioning larynx, the palatopharyngeal sphincter, the lips, the teeth, the tongue and the brain.

Some cleft palate patients have learned various compensatory speech patterns in instances of delayed palate repair, and these patterns are extremely difficult to change or give up. Some patients may be rebellious and resist normal speech as a game to be played with the therapist. Still others may refuse to speak normally because of their hostile reactions.

The mere presence of a cleft palate does not always presuppose a speech defect. Cleft palate patients with normal speech are often observed. If a speech disability is present, its type and cause must be determined.

If a cleft palate is closed before the formation of definitive speech habits and if the palate functions well, normal speech may be expected and no speech therapy is required.

If a cleft palate is closed after the formation of some speech patterns and functions well, speech therapy may or may not be used depending on the age and environment of the patient and how much advantage is to be expected.

If a cleft palate is repaired but its function is inadequate for reasons other than mechanical, speech therapy is recommended. This type of patient might be able to pronounce a kuh sound perfectly during a test but be unable to do so during speech. (If the kuh sound can be produced at all, sphincter function is confirmed.)

If a cleft palate is repaired and its function is nonexistent, speech therapy is a waste of time, money and energy except to teach compensation speech patterns to the patient whenever possible.

After an examination of a cleft palate patient with a speech disability, a diagnosis of the disability should be made and a plan of therapy evolved that will lead to the goal of normal speech when possible.

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Association between colour of the iris of the eye and reaction to dental pain

Philip R. N. Sutton. *Nature* 184: 122 July 11, 1959

In Australians of European stock, an association has been found between the color of the eyes and the reaction to pain resulting from cavity preparation. Examination has been made of 403 consecutive subjects whose teeth were prepared for filling. The Borden high-speed air rotor apparatus was used. The subjects ranged in age from 3 to 50 years.

According to his pain reaction, each subject was assigned to one of the following four classes: (1) no pain reaction during preparation of the cavity; (2) a slight reaction; (3) a pronounced reaction, and (4) a reaction so great as to require the injection of a local analgesic. The color of the iris

was observed in each subject; nine categories, ranging from blue to dark brown, were used. The reaction to pain was given arbitrary values ranging from 0 to 3, and the color of the iris, values ranging from 1 to 9.

Although judgments as to reaction to pain and to eye color were subjective, a test to establish the reproducibility of the results was satisfactory; of 136 subjects reassessed between one and four weeks after the original examination, the same values were obtained for the color of the eyes in 115 subjects, and for pain reaction in 114.

The association between color of the eyes and reaction to dental pain was highly significant. The reaction to pain grew as the color of the eyes tended from blue through blue-gray, green-gray, gray-green, green, hazel, light brown, brown to dark brown. About 13 per cent of the subjects required the injection of a local analgesic for cavity preparation; no blue-eyed subjects required an analgesic; only 2 per cent of those with grayish-blue or greenish-gray eyes required an analgesic; 30 per cent of subjects with light brown or brown eyes required an analgesic and 53 per cent of those with dark brown eyes required an analgesic.

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Resuscitation in the dental office

Peter Safar. *J.Am.D.Soc.Anesthes.* 7:5:4-8 May 1960

Being prepared for resuscitation in the dental office requires a minimum of equipment and drugs. The dentist's skill and judgment and his practical experience in the management of unconscious patients are more important than elaborate and expensive resuscitation equipment.

The key to successful resuscitation is immediate oxygenation. Speed is more important than the concentration of oxygen in the resuscitative gas. A few effective inflations of the lungs sometimes are sufficient to restore failing circulation. Mouth-to-mouth breathing, with or without the use of adjuncts, should be learned by all dentists and physicians.

The following step-by-step outline will prepare the dentist for rapid action in the event of a respiratory or circulatory emergency:

1. An open airway is provided. The patient is placed in the supine position, his head is tilted back and his mandible is held forward to prevent pharyngeal obstruction by the tongue. If necessary, an artificial oropharyngeal airway is inserted.

2. If there are no breathing movements, mouth-to-mouth breathing is begun. The S-shaped airway is used if it is available, but time should not be wasted in looking for it. If a bag-mask unit with an anesthesia machine or an oxygen cylinder is available, another person should be asked to get it ready while the practitioner performs mouth-to-mouth breathing.

3. If the patient's lungs cannot be inflated, the pharynx should be checked for foreign matter. If there is solid foreign matter in the pharynx, the pharynx should be cleared with fingers or a cloth.

4. If there is still obstruction, probably it is caused by laryngospasm. Laryngospasm often can be treated successfully by an increase of inflation pressure. If this fails, the practitioner can perform orotracheal intubation or tracheotomy [if sufficiently trained to do so]. Then the lungs are inflated by blowing intermittently into the tube. Blind nasotracheal intubation is not suitable for resuscitation.

5. If after a few lung inflations the patient still is apneic and a pulse cannot be felt in the carotid artery, the sternum is pressed forcefully and repeatedly against the patient's back, between lung inflations. This may squeeze the heart sufficiently between sternum and vertebral column to move blood. If the accident occurs in the hospital and there is a competent assistant, "open chest cardiac massage" (left anterior thoracotomy with manual systole) is indicated, but this should not be attempted in the dental office unless the operator is surgically trained and equipment for hemostasis and closure of the chest is available.

6. If the patient is breathing adequately, but his blood pressure is low or unobtainable, a vasopressor drug is injected intravenously, and the patient is placed in a supine position with the head lowered.

7. In the event of convulsions, adequate pulmonary ventilation is provided first, then a small dose of a short-acting barbiturate is injected intravenously.

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Natural mummification

E. Born. *Zbl.allg.Path.path.Anat.* 99:490-498 April-June 1960

Natural mummification of human corpses is relatively common in the hot and dry desert regions of Asia and Africa. In the temperate climates of Europe and North America, natural mummification is rare enough to arouse the interest of fiction writers such as Flaubert and Bergengruen and of scientists such as Reinhardt and Virchow.

The normal process of mummification consists of an autolysis by various enzymes produced by bacteria and of disintegration of all the soft tissues and most bones as the result of an oxidative process.

Natural mummification appears to involve only autolysis and disintegration of tissues without complete putrefaction, and presupposes a rapid dehydration.

Mummification, however, may be due either to specific peculiarities of the burial places (such as lead vaults) or to individual factors such as the bodies of cholera victims which are especially prone to complete dehydration. The water content of a mummified corpse is as low as from 5 to 15 per cent.

Histologic examination of the soft tissues, bones and teeth of a mummy, buried about 250 years ago in the lead vaults of Bremen, revealed destruction of all soft tissues and most of the bones. But there was an almost intact skin and a completely intact set of teeth in partially decomposed jaws.

Bundles of collagenous and elastic fibers could still be distinguished but their nuclear structures had disappeared. A few bundles of muscle fibers in the oral cavity and the face still showed striation. The facial epidermis was destroyed but the corium was preserved.

All specimens examined contained spores of minute parasitic and saprophytic fungi which were capable of growth in culture media. The fact that they derived from strains of *Penicillium* and *Mucor* possibly accounts for the inhibition of bacterial decomposition.

Krankenhaus, Uchtspringe Altmark, Germany

Demographic evolution and actuality of the problem of gerontology

E. Martin. *Schweiz.med.Wschr.* 89:339-342 March 28, 1959 [in French]

Demographic and morbidity statistics in all civilized countries reveal a continuous increase in both aging and chronically sick people, as well as an unfavorable ratio between healthy and sick persons.

In order to cope with the problem of gerontology—which gradually must become worse—it appears necessary to examine and recognize the accommodation of senescent patients who require adequate medical and dental care.

Obviously, all aging and aged persons cannot be placed in institutions, and even if this would be possible, these institutions do not provide efficient facilities for medical and dental care for the inmates.

Senescent patients, like the chronically ill, need to be rehabilitated before they become acutely sick and require immediate medical or dental treatment.

At present, every physician or dentist encounters in his practice many elderly patients. Therefore, the practitioner ought to be aware of the particular characteristics of disease in old people and of the specific treatment required by them.

The dental, medical, psychologic and economic problems which arise before, during and after the treatment of aging persons can be solved only by a team of specialists (dentists, physicians and gerontologists) and by the development of disease-preventing and social measures, thereby initiating a true health organization for the care of senescent people.

Clinical medicine and clinical dentistry must be integrated in a nationwide, sociological program in which the new generation of physicians and dentists must become acquainted with the problems of gerontology before graduation.

At present, the students graduating from medical or dental school usually are not well informed about the requirements of senescent people.

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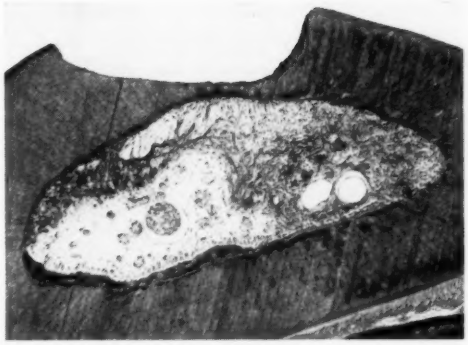

Figure 1 Osteodentin formation in the pulp and almost complete aplasia of postoperative dentin under a deep cavity prepared by a bur run dry at 6,000 rpm

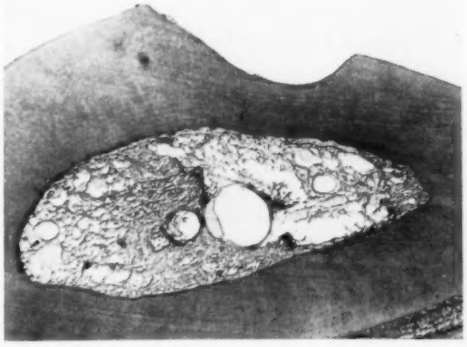

Figure 2 Pulpal degeneration and complete generalized aplasia of postoperative dentin under a medium cavity prepared with an air abrasive device

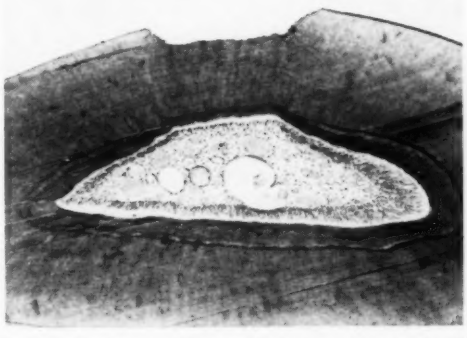

Figure 3 A prominent calciotraumatic band all around the pulp, and pronounced hypoplasia of dentin under a shallow cavity prepared in a rat incisor with an ultrasonic device

Operative dentistry

Effects of different cutting procedures on dentin apposition in rat incisors

Maury Massler and Michel Serfaty. *J.D.Res.* 39:619-628 May-June 1960

To study the effects of three different cutting instruments on the odontoblasts and pulp, cavities were prepared in the lower left incisors of 69 male albino rats. The lower right incisors were used as controls. The animals were sacrificed after seven days and the teeth were sectioned and examined histologically. The instruments used were a rotary bur, air abrasive and an ultrasonic device.

Under shallow cavities the calciotraumatic line was only faintly accentuated and the postoperative dentin was normal in amount and structure when a bur was used for cutting. Under medium cavities, the calciotraumatic line was more prominent. Two of the five specimens in this group showed a normal amount of postoperative dentin and in three specimens dentin hypoplasia was present. Under deep cavities, the calciotraumatic line was prominent and only two of the five specimens in this group exhibited normal postoperative dentin formation; three specimens exhibited abnormal postoperative dentin. In one of the latter specimens, the postoperative dentin was hypoplastic, and in the remaining two specimens complete aplasia was noted. In one of the latter specimens, the pulp was severely inflamed and filled with osteodentin (Fig. 1).

In general, the reaction to preparing shallow cavities with a bur was the same as that reported by Mohammed and Schour (1953), Silberkweit and others (1955) and Perreault and others (1956). However, the reaction under medium and deep cavities was much more severe than reported by previous investigators. In this study, hypoplasia and aplasia occurred under medium cavities in three of five specimens, whereas pre-

vious investigators reported only mild hypocalcification. Under deep cavities, previous investigators had reported mild to moderate hypoplasias, whereas this study showed severe aplasia and osteodentin formation within the pulp. Undoubtedly this was due to the fact that in this study the bur was revolved at 6,000 rpm (without coolant), whereas in previous studies the average speed ranged from 300 to 500 rpm. The higher speed was used to achieve a severe reaction for comparison with the effects caused by the air abrasive and ultrasonic devices.

Severe damage to the pulp was apparent under more than half the cavities cut with the air abrasive device, even under shallow cavities. In general, the disturbance tended to increase as the cavity became deeper. However, the relation to cavity depth was not so strongly correlated as in the series cut by the bur. In nine specimens with medium cavities, for instance, three showed normal postoperative dentin formation; in four specimens, hypoplasia was pronounced, and in one specimen (Fig. 2), aplasia was noted under the cavity.

In six specimens with shallow cavities cut by the ultrasonic device, only two showed normal postoperative dentin formation. Four showed a pronounced hypoplasia and hypocalcification (Fig. 3). In 11 specimens with medium cavities, eight showed normal postoperative dentin formation, two showed hypoplasia and one showed aplasia. Of five specimens with deep cavities, four showed normal postoperative dentin formation and one showed a slight hypoplasia. Damage to the odontoblasts was evident in slightly less than half the specimens prepared with the ultrasonic device, even under shallow cavities. In general, the damage to the pulp increased with cavity depth, but the relation was not so direct as under cavities prepared with the bur.

When cavities were cut with the bur at 6,000 rpm, the effects were more severe as the cavity became deeper. The findings were more severe than those previously reported by other investigators.

The effects on the pulp of preparing cavities with the air abrasive or ultrasonic device generally were not very different from the effects produced by the bur. Under shallow cavities the pulpal effects were more severe when the air abrasive and ultrasonic instruments were used than when the bur was used. No significant differences were observed under medium and deep cavities.

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The cervical amalgam restoration and its failure

G. F. Kantorowicz. *D.Practitioner* 10:158-161 March 1960

Two hundred Class V restorations in patients seen for the first time at the Royal Dental Hospital School of Dental Surgery were examined. Only those restorations completed at least six months previously were included. A restoration with smooth surfaces, no pitting, and no subgingival or supragingival edges was regarded as satisfactory; all others were regarded as failures.

Only 55 of the 200 restorations were satisfactory. The remainder showed marginal failure, pitting, secondary caries, or could be flicked out with the probe. The chief causes for failure were judged to be underextension, water contamination and lack of retention or condensation, and faulty finishing or polishing of the margins of the restoration, in that order.

The cavity preparation for the Class V restoration must be carried out according to Black's principles, with the gingival wall of the cavity in relatively caries-immune regions to avoid secondary caries and marginal failures.

Neglected oral hygiene must be considered a predisposing cause for failure, and the patient should be instructed accordingly.

Faulty edges should be removed at the next visit, with finishing burs, hand instruments and sandpaper disks. The margins must be well polished. Water contamination and undercondensation are the main causes of pitting of the amalgam. Water can be excluded from most cavities by the use of cotton wool rolls, matrix bands or a rubber dam. Moisture can be a large factor in failure. Astringents usually are helpful in reducing marginal seepage. Ten per cent zinc chloride, 50 per cent trichloracetic acid, or a strong solution of epinephrine applied to the gingiva with a blunt plastic instrument will stop

marginal seepage and will remove the soft tissue from the cavity edge.

Condensation of amalgam on a convex surface is difficult. Use of the Dentatus amalgam condenser with the concave head yields a good result. The Tofflemire matrix holder with the "window" type of band is most suitable for this type of cavity. The window is cut so that it is a little smaller than the cavity, to provide a firm wall against which the amalgam is condensed.

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Periodontosis: a nonspecific psychosomatic syndrome

Lucas I. González. *An.españ.odontoestomat.* 19:3-11 Jan. 1960

Many authors now recognize that periodontosis and other forms of periodontal disease may be caused by emotional or psychic factors. These factors are manifested in bruxism, or reflexly through the nervous pathway affecting the periodontium. Another possible etiologic factor is a disturbance of the adrenohypophysial mechanism, because certain periodontal conditions improved after treatment with hormones such as adrenocorticotrophic hormone (ACTH) or corticoids (cortisone).

Periodontosis may be classified as a nonspecific syndrome because the disease has many causes, but it can be called a psychosomatic syndrome because its somatic causes are equalled in importance by those that are psychic in origin.

The manifestations of a disease with a determined etiology are properly referred to as specific symptoms, for example, blisters caused by a burn. Other symptoms, such as shock and physical or mental disturbance which often are associated with various conditions such as burns, injuries, hemorrhages, intoxications, or severe emotional traumas, can be called only nonspecific symptoms.

The systemic conditions which have been suggested as causing periodontal disease act as alarm signals, signifying the presence of stress. Stress, in turn, affects the periodontium. Unsuitable or deficient diet creates a predisposition to periodontal disease, and endocrine disturbances are often associated with periodontosis or gastroduodenal ulceration, both of which are initial symptoms of stress.

Periodontal diseases also may be classified as collagenoses (manifestations of stress) such as Selye's general adaptation syndrome, or as allergies (specific forms of collagen disease characterized by an insufficient antihyaluronidase activity). In other types of psychosomatic disease (pathoneuroses), organic factors may cause psychic disturbances, as for example, when an oral infection leads to psychoneurosis.

The term "psychosomatic" is not an ideal word to designate the mind-body relationship in disease having bodily symptoms of psychic, emotional or mental origin, because all clinical syndromes are psychosomatic. Until this fact is generally accepted, the use of the term seems justified.

Acevedo 1973, Buenos Aires, Argentina

Treatment of complex periodontitis by insertion of lyophilized cartilaginous grafts

A. J. Held and M. Spirgi. *Parodontol.,Zürich* 14:9-14 May 1960

Complex periodontitis is characterized by formation of deep vertical pockets and by an obliquely destroyed alveolar bone. Frequently, these lesions affect only an isolated tooth in an otherwise intact dentition. In all such instances, the isolated bony pocket is the result of a local trauma.

As treatment of these specific periodontal lesions, of which Roy's serpiginous abscess and spinal atrophy represent special entities, several technics have been proposed besides the extraction of the involved teeth: (1) gingivoplasty to eliminate, partially or completely, the walls of the bony pocket; (2) curettage to remove calculus, granulation tissue and epithelial fragments; (3) combination of curettage and gingivoplasty ("open sky" curettage) and (4) trans-gingivo-

alveolar curettage in which the pocket is approached by incising the vestibular side of the gingivoalveolar wall.

Beube (1936), Krömer (1956), Linghorne (1957), and Cross (1957) have proposed insertion of bone chips after curettage. According to Cross, this technic, aided by the bone chip insertion, obtains bone regeneration resulting in filling periodontal pockets 8 mm. deep.

In 1958, the authors and G. Fiore experimented with reimplantation associated with insertion of bone particles into periodontal pockets with satisfactory results.

After consideration of the possibilities offered by experience in plastic surgery using hyaline cartilage, a series of experiments was carried out to apply this technic to periodontal treatment. In these experiments, cartilaginous grafts, treated and preserved by lyophilization, were used.

Fragments of cartilaginous tissue, rapidly frozen at a temperature of −70°C., were desiccated in a vacuum and preserved in this condition until the evening before their use, when the tissues were rehydrated.

The technic was first described by Zurbuchen in 1959, and it consists of the following seven procedures:

1. Cartilaginous tissue is taken from healthy subjects (less than 45 years old) who meet with a fatal accident.

2. A series of serologic tests is made.

3. The cartilaginous tissue, removed either during the first six hours after death if the corpse is kept at room temperature, or 36 hours after death if the corpse is kept in a freezing chamber at a temperature below 3°C., is placed in a solution containing penicillin and streptomycin, and later in an 1 per cent beta-propriolactone solution for two hours.

4. The cartilage fragments are rinsed, placed in Pyrex tubes and immersed in a mixture of acetone and carbonic ice to obtain immediate freezing.

5. Dehydration is achieved in a vacuum under a pressure of 0.0025 mg. mercury. The tubes are sealed by using an oxyhydrogen blowpipe and kept at room temperature.

6. Two hours before the grafts are used, they are rehydrated in a physiologic solution containing antibiotics.

7. Grafts to be used must possess the following qualities: (1) the ability to be revitalized by living elements because of the loss of antigenicity and electric potential; (2) ease of cutting into adequate shapes (relative softness), and (3) facility of insertion (elasticity and flexibility).

From the time they are delivered to the operator the grafts must be aseptically handled. They are taken from the rehydration solution and put on a sterilized glass plate covered by a sterilized sheet. The operator, wearing mask and gloves, inserts the trimmed grafts into the surgically prepared "groove" after using chlortetracycline hydrochloride in powder form.

Prior to the insertion of the grafts all carious teeth are extracted, scaling is done, all irritating factors provoking gingival lesions are eliminated, and the occlusion is equilibrated.

A double incision is made from the gingival crest to its base (in trapezoid form), at least 1 cm. from the periodontal pocket. The larger part of the flap is in an apical direction and assures an optimal blood supply. A retention groove, near the apex, is prepared to stabilize the graft after insertion. Groove, graft and the fibromucous flap are sprinkled with chlortetracycline powder. The graft, cut into a suitable shape, is inserted. The incisions are carefully sutured.

The wound is covered with a surgical cement, and the patients receive antibiotics for from five to six days.

In all instances, the grafts were well-tolerated. All experiments were controlled by successive roentgenograms taken at the same angle, to permit valid comparison.

The results prove that the insertion of lyophilized cartilaginous grafts into periodontal pockets promotes formation of new bone, filling completely not only the pocket but also the surgical groove created for stabilization of the graft.

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Endodontics

The effect of temperature change on the sealing properties of temporary filling materials. Part I

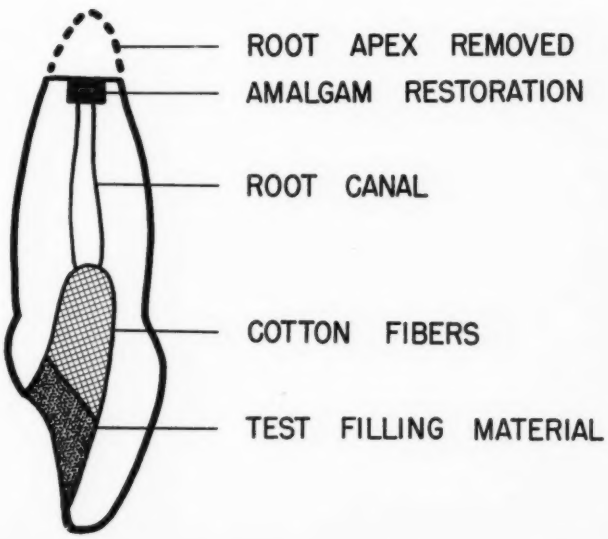
Leonard Parris and Peter Kapsimalis.
Oral Surg.,Oral Med.& Oral Path. 13:982-989 Aug. 1960

The objective of this experiment was to test the sealing properties of temporary filling materials by means of procedures that reproduced, as closely as possible, conditions found in the mouth.

The material consisted of 117 recently extracted noncarious, nonrestored, sound anterior teeth. About 2 mm. of the root end of each tooth was removed with a carborundum disk. A Class I cavity was prepared in the center of the cut root end and filled with amalgam. This was done to eliminate the possibility of dye penetration through the root apex (see illustration).

On the lingual surface, halfway between the incisal edge and the cingulum, a funnel-shaped access cavity was prepared, exposing the pulp chamber. The cavity was of a size and shape to permit convenient endodontic manipulation. The material in the pulp chamber was removed with a no. 6 round bur. Cotton fibers were packed into the clean, dry pulp chamber to a level about 2 mm. below the lingual surface of the access cavity. The filling material to be tested was placed over the cotton fibers until the access cavity was filled. All materials used were burnished tightly against the margins of the cavity.

Eight commonly used temporary filling materials—gutta-percha (both temporary stopping and baseplate), two brands of zinc phosphate temporary cement, two brands of zinc phosphate permanent cement, zinc oxide-eugenol cement, Cavit (a zinc oxide, polyvinyl preparation)—and amalgam (the control) were tested. The cavity-sealing properties of all test materials were evaluated at room temperature and also after ten cycles of temperature change from 60°C. to 4° C. The sealing properties of each of the test materials was compared by using a 2 per cent aqueous solution of aniline blue dye. A leakproof seal of the cavity margins was not maintained if the dye penetrated the test filling material and caused a blue discoloration of the cotton fibers



Diagrammatic cross section of a test tooth

which had been packed beneath the test filling.

In the tests at room temperature, all filling materials showed consistent leakage except three—zinc oxide-eugenol cement, Cavit and amalgam.

In the tests involving ten cycles of temperature change, those materials which showed leakage to the dye solution at room temperature also showed leakage when subjected to temperature changes. Zinc oxide-eugenol cement showed leakage in five of ten teeth subjected to temperature changes.

Of the temporary filling materials tested, only Cavit maintained leakproof cavity seals both at room temperature and after repeated temperature changes. Amalgam, a permanent filling material, was equally effective.

3223 North Broad Street, Philadelphia, Pa.

Tissue tolerance to the root canal filling material AH 26: histologic findings

Benedikt Maeglin. *Schweiz.Mschr.Zahnhk.* 70:212-222 March 1960

In 1957, F. Schroeder developed a new root canal filling material on an epoxy resin base, temporarily named AH 26 (De Trey), which recently became available for endodontic practice.

During the last three years, the new material had been tested experimentally and clinically at the prosthodontic department of the Dental Institute in Basel, Switzerland.

Histologic examinations of specimens taken from nine patients in whom root canal fillings were inserted from 9 to 30 months prior to examination revealed that the new material invariably was well tolerated by the periapical and periodontal tissues, and that (according to Schroeder) it deserves to be called an "implantable" material.

In not a single instance did the filling material cause inflammatory reactions. Healthy fibrillar connective tissue but no necrotic tissue was observed in the region of the filling. However, in control patients in whom the root canals had been filled with other, chemically more active, materials, necrosis of tissue in direct contact with these materials occurred.

The use of AH 26 does not promote the formation of new hard tooth substances but neither does it prevent or impair tissue regeneration.

Even in instances in which the root canal had been overfilled, the process of connective tissue inclusion remained undisturbed. There were no signs of resorption of AH 26 in fillings made 30 months prior to the investigation. This seems to be a significant advantage, because the use of other, easily resorbable and chemically active root canal filling materials frequently produced inflammatory reactions which could be classified as varying between moderate and severe.

Further tests of the properties of AH 26, especially the effects on the pulp, are necessary to establish whether the material meets the required biologic standards.

91 Spalenring, Basel, Switzerland

Oral surgery

Oral surgery laboratory course for undergraduate dental students

John D. Gehrig. *J.D.Educ.* 24:130-133 June 1960

Although dental graduates receive the degree of Doctor of Dental Surgery, only a limited amount of clinic time is given to surgery in dental school. To provide students with more clinic time in oral surgery, the School of Dentistry, University of Washington, has introduced a voluntary summer surgery plan. The plan has met with an enthusiastic response. Almost every student desired this extra clinic time, but, because of a lightened summer patient load, only a third of the class could be accommodated. Arrangements also have been made to inaugurate a pilot group of senior students in the Oral Surgery Outpatient Clinic at the King County Hospital. The present clinic time has been augmented by the introduction of an oral surgery laboratory course.

The objectives of the oral surgery laboratory course are to: (1) familiarize the student with oral surgery instruments and develop skill in their manipulation; (2) develop dexterity in the performance of oral surgery technics; (3) instill confidence in the student's ability; (4) develop gentle handling of soft and hard oral tissues; (5) inculcate sterile technic, and (6) develop perspicacity in surgical diagnosis as well as in the evaluation of medical influences. The syllabus contains information concerning the laboratory schedule; the instrument list; the operational scope; the instrumentation; the emergency kit, and a brief outline of each procedure, plus 17 pages of lecture notes on exodontics and oral surgery.

The first three periods of the course are patterned after the text *Practical Oral Surgery* by Henry B. Clark, Jr. The remaining seven periods are outlined. Additional periods in experimental surgery performed on dogs have been added, and additional exercises not covered in the outline are introduced as time and case histories indicate. These exercises are in such subjects as blood pressure, bleeding time, cuff test, oxygen administration, artificial resuscitation, tracheotomy palpation, venipuncture and the intramuscular injection of penicillin.

Each class period contains a televised demonstration on models. The usual time for the demonstration is 50 minutes, after which the class adjourns to the laboratory for the remaining two hours to complete the case history and do the laboratory exercises under staff supervision.

Grades are derived through weekly case history quizzes in which the student's knowledge is tested in the fields of diagnosis, evaluation of systemic influences, medical precautions, premedication, sequence for full-mouth extractions, anesthesia and steps in various surgical procedures. A large part of the grade is based on the final laboratory test and a written examination.

The logical time for presenting this laboratory course is the quarter immediately preceeding clinical surgery. The course serves to clarify lecture material and to facilitate its application.

School of Dentistry, University of Washington, Seattle, Wash.

The Nebraska cleft palate team

Donette Keys. *J.Nebraska D.A.* 36:4:6-9 June 1960

The first cleft palate team in Nebraska was organized in 1956 at the University of Nebraska College of Dentistry. The group entered into an agreement with the State Board of Public Welfare, through the Office of Services for Crippled Children. Most of the patients examined by the team are referred by this state agency, but some are private patients. The Nebraska cleft palate team presently has ten members—a pediatrician, plastic surgeon, otolaryngologist, pedodontist, two orthodontists, a prosthodontist, oral surgeon, speech therapist and medical social worker.

The pediatrician observes the development of the child, and informs the parents about care and development of their child. The plastic surgeon may perform operations on clefts, and cosmetic surgery. The otolaryngologist makes sinusal and tonsillar evaluations. The pedodontist has an im-

portant role, since extensive carious lesions usually accompany the badly malposed teeth and resultant abnormal occlusion existing in many patients with cleft palate. These children also may present management problems which call for the services of a specialist in this field. The prosthodontist advises on the construction of a speech appliance or a more permanent type of rehabilitation procedure. The oral surgeon may perform various surgical interventions such as closure of the cleft, removal of supernumerary teeth and of other teeth which complicate the cleft repair. The success of surgical or prosthetic repair of a cleft palate is determined largely by the effectiveness with which it subserves the speech process, and here the speech therapist assumes a vital role. The medical social worker serves primarily as a liaison between the family and the team. She discovers and tries to help with emotional problems of both the parents and the child; she makes arrangements for appointments, hospitalization and follow-ups.

Most of the surgical interventions are performed at the Orthopedic Hospital in Lincoln. Group therapy is used, a number of children of the same age being in the hospital at the same time.

On the first or second Thursday of each month, the hallway waiting room of the University Dental Clinic is lined with anxious parents and playful children. The new patients are taken into a small, well-lighted clinic and examined; each team member makes his evaluation of the treatment needed and the time to begin the treatment. Two weeks later the team members meet again in a seminar, with each member presenting his diagnosis and treatment plans for the patients he has examined. The plans for each new patient are discussed, debated, perhaps altered and finally recorded. Arrangements are made to begin the rehabilitation services for each child.

Some of the operating is done by graduate students at the dental college, or by staff members who also are team members. Some of the work is done by practicing dentists who have volunteered to aid in this program and who live in or near the community of the patient; this arrangement makes it possible for the patient to get the necessary treatment without having to travel to Lincoln several times. With these patients, the team still makes a complete treatment plan and presents it to the participating dentist.

The Nebraska cleft palate team is helping over 200 patients to go into life on an equal basis with other children.

College of Dentistry, University of Nebraska, Lincoln, Neb.

Changes in amino acid contents of blood after oral surgical interventions

U. Torelli, E. Turco and G. Grossi.
Minerva chir. 15:34-38 Feb. 1960

The plasma levels of the various amino acids were determined in 15 patients in whom oral surgical interventions of varying severity were performed. The amino acid contents were measured at the beginning of the operation, at the end of the operation and after the first postoperative day.

It was found that almost all the amino acids studied decreased immediately after surgery but that the values tended to return to normal within 24 hours. The degree of the postoperative decrease, however, appeared to be not related to the severity of the operation performed.

In an attempt to interpret these findings, it was established that the loss of potassium within the cells caused a significant uptake of amino acids related to the variations of sodium content which were inverse to those of potassium.

It may be suggested that sodium enters the cells as a compound formed with neutral amino acids.

One of the immediate consequences of oral surgical interventions, especially of the effects of the anesthetic used, consists of a profound loss of potassium and an uptake of sodium by the cells.

The decrease in the levels of amino acids occurring in the blood during surgical interventions probably is caused by changes in the intracellular and extracellular electrocyte concentrations.

Pathological Institute of the University of Modena, Italy

Anesthesia and analgesia

Extraoral approach to the infraorbital block on the anterior and middle superior alveolar nerves

Jack Coleman Francis. *J.South.California D.A.* 28:216-218 July 1960

Although the extraoral approach to the infraorbital nerve block is a simple technic, it has never met with universal acceptance by the general dental practitioner. Possibly it is the proximity to the eye which creates fear concerning this injection.

The purpose of the infraorbital injection is to block the afferent nerve impulses in the maxillary anterior teeth and the labial supporting structures, at a point within the infraorbital canal, where the anterior and middle superior nerves branch off from the infraorbital nerve, which is the terminal division of the maxillary nerve. The infraorbital injection can be used to obtain profound anesthesia of the anterior teeth for any operative or surgical procedure. Although entrance into the infraorbital foramen presents some difficulties by the intraoral technic, it becomes a relatively simple matter when approached through the surface of the skin.

The supraorbital foramen or notch, the infraorbital foramen, the second bicuspid and the mental foramen all lie in a straight line. The pupil of the eye of a patient looking straight forward also falls on this line.

The infraorbital foramen exits into the infraorbital fossa below the quadratus labii superioris and above the caninus muscle. The foramen is in line with the afore-mentioned anatomic landmarks and lies 3 to 5 mm. beneath the lower margin of the orbit.

Palpation with the index finger will give the patient a feeling of dull pain and deep pressure exactly over the foramen. This action may be of aid in instances where it is difficult to locate the foramen.

Usually, a bony plate separates the orbital contents from the infraorbital canal. Since this is not always so, the needle should not penetrate more than 5 or 6 mm. into the canal. If some of the anesthetic solution enters the orbit, there will be the unpleasant, though transient, symptoms of oculomotor paralysis and possible double vision and blindness.

The patient is placed in the chair with his head, neck and chest in a straight line. The chair is tilted back so that the maxillary occlusal plane is at a 45 degree angle to the floor, and on a level with the operator's elbow.

A surgical scrub is an integral part of a good technic. The skin overlying the foramen is swabbed with a suitable disinfectant. The foramen is located and palpated with the index finger of the left hand. A skin weal is raised by deposit-

Figure 1 The position of the syringe on a skull

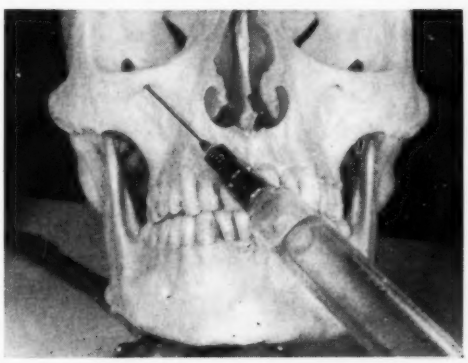


Figure 2 The position of the syringe on a patient

ing a few drops of anesthetic solution just under the skin with a short, 30 gauge needle. After waiting a moment, the dentist introduces a 1½ inch, 25 gauge needle through the weal, keeping the needle underneath the palpating finger. The direction of insertion is a line into the foramen down to the wing of the nose and across the labial aspect of the central incisors, keeping the syringe close to the face (Fig. 1 and 2).

As the needle is felt to enter the canal, it is sealed into the canal by maintaining pressure over the foramen with the palpating finger. This pressure prevents the solution from escaping back into the infraorbital fossa and thereby avoids anesthetizing any of the facial nerves. The syringe is withdrawn and the dentist waits for the symptoms of anesthesia to appear; these symptoms are, subjectively, numbness of the upper lip, and, objectively, the absence of sensation during instrumentation.

The extraoral approach to the infraorbital injection is a simple method of anesthetizing the incisors, cuspid and bicuspids from the midline of the side injected. It requires a minimum amount of anesthetic solution and the possibilities of postoperative complications are few. The infraorbital injection is of great value in major procedures such as removal of impacted teeth, enucleation of cysts and in situations where acute infection precludes the use of an infiltration injection.

625 Broadway, San Diego, Calif.

Untoward reactions to local anesthetics

J.A.M.A. 172:769 Feb. 13, 1960

Q.—Can intradermal or conjunctival tests be used to determine a patient's sensitivity to local anesthetics? If the patient does have such a sensitivity, is it possible to desensitize him?

A.—Although local anesthetic agents may produce an abnormal systemic reaction in a patient, it is doubtful that any anesthetics commonly used could cause true tissue sensitivity that would be prevented by graduated doses of these agents. Allergic manifestations of this nature usually depend on the presence of a protein which is involved in the antigen-antibody reaction.

Reactions to local anesthetic agents administered to the patient prior to dental treatment consist of palpitation, dizziness or fainting. These can be caused by epinephrine or other vasoconstrictors in the solution, or by emotional instability of the patient. Any local tissue swelling which may occur has been attributed to histamine release and can be prevented by administration of an antihistaminic drug. Localized tissue swelling also can be the result of increased reaction by the patient's tissue to trauma.

The future management of a patient who has had one episode of local tissue swelling and may need further dental treatment would require taking a history of the agents used prior to the reactions and determining whether or not vasoconstrictors had been included in the solutions. Since anesthetic agents of distinctly different structure and composition are available, it is possible to use one not related to the one previously administered. Although the value of skin testing is questionable, it should be performed with the agent to be used. Use of vasoconstrictors should be avoided, and it might be wise to give the patient an antihistamine prior to injection of the anesthetic. Should skin tests indicate a reaction, the local nerve block technic should be avoided, and a general anesthetic, such as nitrous oxide, given.

535 North Dearborn Street, Chicago 10, Ill.

A clinical comparison of chloroform and halothane by a blind study technique

Betty J. Bamforth, Karl L. Siebecker, John E. Steinhaus and O. Sidney Orth. *Anesthesiology* 21:273-280 May-June 1960

In this double-blind study, a series of 100 patients ranging in age from 6 months to 79 years was anesthetized with chloroform or halothane as a supplement to nitrous oxide-oxygen. The clinical effects of the two anesthetic agents on blood pressure, pulse and respiration, and postoperative complications, were observed and recorded.

The changes in blood pressure, pulse rate and respiration, and the complications during anesthesia and postoperatively, were similar in the two groups of patients. Halothane bears a strong clinical resemblance to chloroform.

Medical School, University of Wisconsin, Madison, Wis.

Dental Abstracts

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LIST OF PERIODICALS ABSTRACTED

The periodicals from which abstracts were made and printed in Volume 5 of *Dental Abstracts* are listed below in the alphabetical order of their abbreviations. In addition the full title and address of each periodical are given.

Lists of all dental journals published in the United States and of dental journals published outside the United States and currently received in the Bureau of Library and Indexing Service of the American Dental Association are available free from that Bureau.

A.M.A.Arch.Dermat. A.M.A. Archives of Dermatology. American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.

A.M.A.Arch.Otolaryng. A.M.A. Archives of Otolaryngology. American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.

A.M.A.Arch.Surg. A.M.A. Archives of Surgery. American Medical Association, 535 N. Dearborn St., Chicago 10, Ill.

Abstr.Soviet Med. Abstracts of Soviet Medicine. Excerpta Medica Foundation, 111 Kalverstraat, Amsterdam, The Netherlands.

Accepted Dental Remedies Accepted Dental Remedies. American Dental Association, 222 E. Superior St., Chicago 11, Ill.

Acta chir.& traum. Čechoslov. Acta chirurgiae orthopaedicae et traumatologiae Čechoslovaca. Sokolská 31, Prague, Czechoslovakia.

Acta chir.scandinav. Acta Chirurgica Scandinavica. P. A. Norstedt & Söner, Tryckerigatan 2, Stockholm 2, Sweden.

Acta odont.scandinav. Acta Odontologica Scandinavica. 53 Nybrogatan, Stockholm Ö, Sweden.

Acta stomat.,Padua Acta stomatologica Patavina. Via Montana 4, Padua, Italy.

Actual.odontostomat.,Paris Actualités Odonto-Stomatologiques. 6, Rue de la Bûcherie, Paris 5, France.

Aggiorn.pediat. Aggiornamento pediatrico. Viale Goriza 24a, Rome, Italy.

Alum.Bul.Indiana Univ.School Den. Alumni Bulletin of Indiana University School of Dentistry. 1121 W. Michigan St., Indianapolis, Ind.

Am.J.Clin.Nutrit. The American Journal of Clinical Nutrition. 49 W. 45th St., New York 36, N. Y.

Am.J.Ophth. American Journal of Ophthalmology. Ophthalmic Publishing Co., 664 N. Michigan Ave., Chicago, Ill.

Am.J.Orthodont. American Journal of Orthodontics. C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo.

Am.J.Pub.Health American Journal of Public Health and the Nations Health. 374 Broadway, Albany 7, N. Y.

Am.J.Roentg. American Journal of Roentgenology, Radium Therapy and Nuclear Medicine. Charles C Thomas, 301 E. Lawrence Ave., Springfield, Ill.

Am.J.Surg. American Journal of Surgery. 49 W. 45th St., New York 36, N. Y.

Am.Surgeon The American Surgeon. Williams & Wilkins Co., 428 E. Preston St., Baltimore 2, Md.

Anaesthesist, Berlin Der Anaesthesist. Reichpietschufer 20, Berlin W 35, Germany.

Analyt.Chem. Analytical Chemistry. American Chemical Society, 1155 Sixteenth St., N.W., Washington 6, D. C.

An.españ.odontoestomat. Anales Españoles de Odontoestomatología. Avenida de Jose Antonio 27, 8, 3, Apartado de Correos 368, Madrid, Spain.

Anesth.& Analg. Current Researches in Anesthesia and Analgesia. Wade Park Manor, E. 107th & Park Lane, Cleveland 6, Ohio.

Anesthesiology Anesthesiology. American Society of Anesthesiologists, 3 Penn Center Plaza, Philadelphia 2, Pa.

An.Fac.farm.e odont.Univ.São Paulo Anais da Faculdade de Farmácia e Odontologia da Universidade de São Paulo. Rua Três Rios 363, Caixa Postal 8216, São Paulo, Brazil.

Angle Orthodont. Angle Orthodontist. Zuelke Bldg., Appleton, Wis.

An.med., Barcelona Anales de medicina. Vía Layetana, 31, Barcelona, Spain.

Ann.chir.gynaec.Fenn. Annales chirurgiae et gynaecologiae Fenniae. Yrjönkatu 17, Helsinki, Finland.

Ann.chir.,Paris Annales de Chirurgie. 120 Boulevard Saint-Germain, Paris 6, France.

Ann.chir.plast. Annales de Chirurgie Plastique. 15 Rue Saint-Benoit, Paris 6, France.

Ann.Den. Annals of Dentistry. 630 Fifth Ave., New York 20, N. Y.

Ann.otolaryng. Annales d'Oto-Laryngologie. Masson & Cie., 120 Boulevard Saint-Germain, Paris 6, France.

Ann.Otol.Rhin.& Laryng. Annals of Otology, Rhinology and Laryngology. St. Louis, Mo.

Ann.stomat.,Roma Annali di Stomatologia. Viale Regina Margherita 287-B, Rome, Italy.

Antibiot.& Chemotherap. Antibiotics & Chemotherapy, Journal of Experimental and Clinical Studies on Antibiotics, Hormones, and Chemotherapeutics. 30 E. 60th St., New York 22, N. Y.

Arch.Dis.Childhood Archives of Disease in Childhood. British Medical Association, Tavistock Square, London W. C. 1, England.

Arch.Geschwulstforsch. Archiv für Geschwulstforschung. Theodor Steinkopff, Loschwitzerstrasse 32, (10a) Dresden A 53, Germany.

Arch.Ital.mal.appar.diger. Archivio Italiano delle malattie dell'apparato digerente. Via Farini 6, Bologna, Italy.

Arch.Oral Biol. Archives of Oral Biology. Pergamon Press, Ltd., 4 & 5 Fitzroy Square, London W. 1, England.

Arch.peruanos pat.clin. Archivos peruanos de patología y clinica. Department of Pathology, Hospital dos de Mayo, Lima, Peru.

Arch.Pol.Wewnet. Archiwum Polskiej Wewnetrznej, Chalubinskiego 4, Wroclaw, Poland.

Arizona D.J. Arizona Dental Journal. 17 E. Weldon, Phoenix, Ariz.

Arkansas D.J. Arkansas Dental Journal. 5508 W. Markham, Little Rock, Ark.

Arzneimitt.Forsch. Arzneimittel-Forschung, Drug Research. Aulendorf, Württemberg, Germany.

Ärztl.Wschr. Ärztliche Wochenschrift. Reichpietschufer 20, Berlin W 35, Germany.

Austral.D.J. Australian Dental Journal. 135 Macquarie St., Sydney, Australia.

Austral. J.Exper.Biol.& M.Sc. Australian Journal of Experimental Biology and Medical Science. University of Adelaide, Adelaide, Australia.

Biotypologie Biotypologie. 6 Rue de la Sorbonne, Paris 6, France.

Bl.Zahnhk.,Zürich Blätter für Zahnheilkunde. Stauffacherstrasse 3, Zurich, Switzerland.

Brain Brain, A Journal of Neurology. Macmillan & Co., St. Martin's Street, London, W.C. 2, England.

Bratisl.Lekar.Listy Bratislavské Lekárske Listy. Slovenska Akademia Vied, Klemensová 27, Bratislava, Czechoslovakia.

Brit.D.J. The British Dental Journal. 13 Hill St., Berkeley Sq., London W. 1, England.

Brit.J.Anaesth. British Journal of Anaesthesia. John Sherratt & Son, 48-50 Bedford St., N., Liverpool 7, England.

Brit.J.Clin.Prac. The British Journal of Clinical Practice. Harvey & Blythe, Ltd., 9 Oxford Circus, London W. 1, England.

Brit. J.M.Hypnotism British Journal of Medical Hypnotism. 48 Wick Hall, Hove 2, Sussex, England.

Brit.J.Plast.Surg. British Journal of Plastic Surgery. 16-17 Teviot Place, Edinburgh, Scotland.

Brit.J.Surg. British Journal of Surgery. John Wright & Sons Ltd., Bath Rd., Bristol 4, England.

Brit.M.J. British Medical Journal. British Medical Association, Tavistock Sq., London W.C. 1, England.

Bul.5th Dist.D.Soc. (Calif.) Bulletin of the Fifth District Dental Society, California. 3683 E. Shields Ave., Fresno, Calif.

Bul.Indiana Board of Health Bulletin of the Indiana State Board of Health. 1330 W. Michigan St., Indianapolis 7, Ind.

Bul.Nassau Co.D.Soc. Bulletin of the Nassau County Dental Society. 58 Cathedral Ave., Hempstead, N. Y.

Bul.New York Soc.Den.Children Bulletin of the New York Society of Dentistry for Children. 27 E. 95th St., New York 28, N. Y.

Bul.Philadelphia Co.D.Soc. Bulletin of the Philadelphia County Dental Society. 337-338 Bellevue-Stratford Hotel, Broad and Walnut Sts., Philadelphia 2, Pa.

Bul.Rech.Sci.Stomat. Bulletin du Groupement International pour la Recherche Scientifique en Stomatologie. 11-15 Rue de la Commune, Liège, France.

Bul.San Diego Co. D.Soc. Bulletin of the San Diego County Dental Society. 4379 Thirtieth St., San Diego 4, Calif.

Bul.schweiz.Akad.med.Wiss. Bulletin der Schweizerischen Akademie der medizinischen Wissenschaften. Steinentorstrasse 13, Basel 10, Switzerland.

Bul.Soc.méd.Hôp. Bulletin de la Société médicale de l'Hôpital de Paris. 27 Rue l'Ecole-de-Medecine, Paris 6, France

Bul.Tokyo M.D.Univ. Bulletin of Tokyo Medical & Dental University. Bankyo-Ku, Tokyo, Japan.

Bul.WHO Bulletin of the World Health Organization. Palais des Nations, Geneva, Switzerland.

Bus.Screen Business Screen, the International Business Journal of Audio & Visual Communication for Industry—Education and Television. 7064 Sheridan Rd., Chicago 26, Ill.

Cancer Bul. Cancer Bulletin. 2310 Baldwin St., Houston, Texas.

Časop.lék.česk. Časopis Lékaru Českych. Čis. 43, Strana 1365-88, Prague 1, Czechoslovakia.

Central African J.Med. Central African Journal of Medicine. P.O. Box 2073, Salisbury, S. Rhodesia, Africa.

Českoslov.stomat. Československa stomatologie. Krakovská 8, Prague 2, Czechoslovakia.

Chicago Sun-Times Chicago Sun-Times. Sun-Times Plaza, 401 N. Wabash Ave., Chicago 11, Ill.

CIBA Symp. CIBA Symposium. CIBA Ltd. Basel, Switzerland.

Clin.Med. Clinical Medicine. P. O. Box M, Winnetka, Ill.

Czas.stomat. Czasopismo Stomatologiczne. Ul. Filtrowa 30, III pietro, Zaklad Protetyki, Warsaw, Poland.

D.Assist. Dental Assistant. American Dental Assistants Association, 5014 Nina Lee Lane, Houston 18, Texas.

D.Delineator The Dental Delineator. 126 Great Portland St., London W. 1, England.

D.Echo, Heidelberg Dental Echo. Turner-Strasse 20, Heidelberg, Germany.

D.Health Memo.,USPHS Dental Health Memorandum. U. S. Public Health Service, Washington 25, D.C.

D.Health Newsletter Dental Health Newsletter. Department of National Health & Welfare, Ottawa, Canada.

D.Labor Das Dental-Labor. Postfach, Cologne-Lindenthal 3, Germany.

D.Practitioner The Dental Practitioner and Dental Record. John Wright & Sons Ltd., Bath Rd., Bristol 4, England.

D.Radiog.& Photog. Dental Radiography and Photography. 343 State St., Rochester 4, N. Y.

Deut.med.J. Deutsches Medizinisches Journal, Official Organ of the Deutscher Kongress für Ärztliche Fortbildung, Klingsorstrasse 21, Berlin-Steglitz, Germany.

Deut.med.Wschr. Deutsche Medizinische Wochenschrift. Herdweg 63, Stuttgart, Germany.

Deut.Stomat. Deutsche Stomatologie. Neue Grünstrasse 18, Berlin C 2, Germany.

Deut.Zahnärzte Kal. Deutscher Zahnärzte Kalender. Carl Hanser, Munich, Germany

Deut.Zahnärztebl. Das Deutsche Zahnärzteblatt. Lazarettstrasse 2-6, Munich 2, Germany.

Deut.zahnärztl.Zschr. Deutsche Zahnärztliche Zeitschrift. Kolbergerstrasse 22, Munich 27, Germany.

Deut.Zahn Mund Kieferhk. Deutsche Zahn-, Mund- und Kieferheilkunde. Salomonstrasse 18B, Leipzig C 1, Germany.

Fort.Rev.Chicago D.Soc. Fortnightly Review of the Chicago Dental Society. 30 N. Michigan Ave., Chicago 2, Ill.

Fortschr.Kief.Ges.Chir. Fortschritte der Kiefer- und Gesichts-Chirurgie. Herdweg 63, (14a) Stuttgart N, Germany.

Fortschr.Röntgenstr.Nuklearmed. Fortschritte auf dem Gebiete der Röntgenstrahlen und der Nuklearmedizin. Herdweg 65, (14a) Stuttgart N, Germany.

German M.Monthly German Medical Monthly. Georg Thieme, P.O.B. 732, Stuttgart, Germany.

Gior.Batt.Immun. Giornale di Batteriologia e Immunologia. Via Cibrario 72, Turin, Italy.

Hamdard M.Digest Hamdard Medical Digest. Nazimabad, Karachi 18, Pakistan.

Harvard D.Alumni Bul. Harvard Dental Alumni Bulletin. 188 Longwood Ave., Boston 15, Mass.

Health News Health News. 18 Dove St., Albany, N. Y.

Helvet.odont.acta Helvetica Odontologica Acta. Postfach 121, Zurich 28, Switzerland.

Helvet.paediat.acta Helvetica Paediatrica Acta. Steinentorstrasse 13, Basel 10, Switzerland.

Henry Ford Hosp.M.Bul. Henry Ford Hospital Medical Bulletin. 2799 W. Grand Blvd., Detroit 2, Mich.

Human Biology Human Biology, a Record of Research. Wayne State University Press, Detroit 2, Mich.

Illinois D.J. Illinois Dental Journal. 632 Jefferson Bldg., Peoria 2, Ill.

Illinois M.J. The Illinois Medical Journal. Medical Arts Bldg., Monmouth, Ill.

Indiana Alumni Mag. Indiana Alumni Magazine. 301 Union Bldg., Bloomington, Ind.

Inform.dent.,Paris L'Information Dentaire. 16, Rue Vignon, Paris 9, France.

Internat.D.J. International Dental Journal. A. Sijthoff, 37 Wagenstraat, The Hague, The Netherlands.

Internat.J.Clin.& Exper.Hypnosis International Journal of Clinical and Experimental Hypnosis. Mount Royal & Guilford Aves., Baltimore 2, Md.

Internat.J.Health Educ. International Journal of Health Education. 3, Rue Viollier, Geneva, Switzerland.

Iowa D.J. The Iowa Dental Journal. 639 Insurance Exchange Bldg., Des Moines 9, Iowa.

Irish D.Rev. Irish Dental Review. 27 S. Frederick St., Dublin, Ireland.

Irish J.M.Sc. Irish Journal of Medical Science. Cahill & Co., Ltd., Parkgate Printing Works, Dublin, Ireland.

J.A.D.A. The Journal of the American Dental Association. 222 E. Superior St., Chicago 11, Ill.

J.A.M.A. The Journal of the American Medical Association. 535 N. Dearborn St., Chicago 10, Ill.

J.All India D.A. Journal of the All-India Dental Association. Gen. Assurance Bldg., 232 Dr. Dadabhoi Nabroji Rd., Bombay 1, India.

J.Am.Acad.Gold Foil Operators Journal of the American Academy of Gold Foil Operators. 1024 Esperson Bldg., Houston 2, Texas.

J.Am.Col.Den. Journal of the American College of Dentists. 14615 E. Jefferson Ave., Detroit 15, Mich.

J.Am.D.Hygienists'A. Journal of the American Dental Hygienists' Association. 100 E. Ohio St., Chicago 11, Ill.

J.Am.D.Soc.Anesthes. Journal of the American Dental Society of Anesthesiology. 1275 Delaware Ave., Buffalo 9, N.Y.

J.Am.Osteopath.A. The Journal of the American Osteopathic Association. 212 E. Ohio St., Chicago 11, Ill.

J.Am.Pharm.A. Journal of the American Pharmaceutical Association. 2215 Constitution Ave., N.W., Washington 7, D.C.

J.Canad.D.A. Journal of the Canadian Dental Association. 234 St. George St., Toronto 5, Ontario, Canada.

J.Colorado D.A. Journal of the Colorado State Dental Association. 903 Republic Bldg., Denver 2, Colo.

J.Connecticut D.A. Journal of the Connecticut State Dental Association. 37 Linnard Rd., West Hartford 7, Conn.

J.D.A.South Africa Journal of the Dental Association of South Africa. P.O. Box 3094, Cape Town, South Africa.

J.dent.belge Journal Dentaire Belge. 166 Chaussee D'Etterbeek, Brussels 4, Belgium.

J.D.Educ. Journal of Dental Education. American Association of Dental Schools, 840 N. Lake Shore Drive, Chicago 11, Ill.

J.D.Med. Journal of Dental Medicine. 57 W. 57th St., New York 19, N. Y.

J.D.Res. Journal of Dental Research. University of Chicago Press, 5750 Ellis Ave., Chicago 37, Ill.

J.Den.Children Journal of Dentistry for Children. American Society of Dentistry for Children, 13201 Miles Ave., Cleveland 5, Ohio.

J.Dist.Columbia D.Soc. Journal of the District of Columbia Dental Society. 1835 Eye St., N.W., Washington 6, D.C.

J.estomat.,Lisbon Jornal de Estomatologia. Rua Joaquim Antonio de Aguiar, N.73-4, Lisbon, Portugal.

J.Florida D.Soc. Journal of the Florida State Dental Society. 518 Tampa St., Tampa, Fla.

J.Georgia D.A. Journal of the Georgia Dental Association. Suite 307, Southern United Bldg., Macon, Ga.

J.Gerontol. Journal of Gerontology. 660 S. Kingshighway Blvd., St. Louis 10, Mo.

J.Hist.Med. Journal of the History of Medicine and Allied Sciences. 333 Cedar St., New Haven, Conn.

J.Indiana D.A. The Journal of the Indiana State Dental Association. 1012 Hume Mansur Bldg., Indianapolis 4, Ind.

J. Internat.Col.Surgeons The Journal of the International College of Surgeons. 1516 Lake Shore Dr., Chicago 10, Ill.

J.Kentucky D.A. Journal of the Kentucky Dental Association. 2208 Dundee Road, Louisville 5, Ky.

J.M.Soc.New Jersey Journal of the Medical Society of New Jersey. Trenton, N.J.

J.Michigan D.A. The Journal of the Michigan State Dental Association. 112 E. Allegan, Lansing, Mich.

J.Missouri D.A. The Journal of the Missouri State Dental Association. 201 Merchants Bank Bldg., Jefferson City, Mo.

J.Nebraska D.A. The Journal of the Nebraska State Dental Association. 1112 Federal Securities Bldg., Lincoln, Neb.

J.Neurosurg. Journal of Neurosurgery. Charles C Thomas. 301-27 E. Lawrence Ave., Springfield, Ill.

J.New Jersey D.Soc. Journal of the New Jersey State Dental Society. 407 Cooper St., Camden 2, N.J.

J.N.Carolina D.Soc. The Journal of the North Carolina Dental Society. P. O. Box 11065, Raleigh, N. C.

J.Nihon Univ.School Den. Journal of Nihon University School of Dentistry. Surugadai, Chiyoda-ku, Tokyo, Japan.

J.Ontario D.A. Journal of the Ontario Dental Association. 230 George St., Toronto, Ontario, Canada.

J.Oral Surg.,Anesth.& Hosp.D.Serv. Journal of Oral Surgery, Anesthesia and Hospital Dental Service. Formerly Journal of Oral Surgery. 222 E. Superior St., Chicago 11, Ill.

J.Osaka Univ.D.Soc. The Journal of Osaka University Dental Society. 32 Joancho, Kitaku, Osaka, Japan.

J.Path.& Bact. Journal of Pathology and Bacteriology. Oliver & Boyd, London, England.

J.Pediat. Journal of Pediatrics. C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo.

J.Periodont. Journal of Periodontology. 1121 W. Michigan St., Indianapolis 2, Ind.

J.Pros.Den. The Journal of Prosthetic Dentistry. C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo.

J.radiol.électrol. Journal de radiologie et diélectrologie & Archives d'électricité médicale. Masson et Cie., Paris, France.

J.School Health Journal of School Health. American School Health Association, 515 E. Main St., Kent, Ohio.

J.South.California D.A. Journal of the Southern California State Dental Association. 903 Crenshaw Blvd., Los Angeles 19, Calif.

J.Tennessee D.A. Journal of the Tennessee State Dental Association. 210 Twenty-third Ave. N., Nashville 5, Tenn.

J.West.Soc.Periodont. The Journal of the Western Society of Periodontology. 1998 D St., San Bernardino, Cal.

J.Wisconsin D.Soc. The Journal of the Wisconsin State Dental Society. 704 W. Wisconsin Ave., Milwaukee 3, Wis.

Lancet Lancet. 7 Adam St., Adelphi, London W.C. 2, England.

Landarzt Der Landarzt, Zeitschrift für alle praktischen Ärzte. Hippocrates, Neckarstrasse 121, Stuttgart O, Germany.

Laryngoscope The Laryngoscope. 640 S. Kingshighway, St. Louis 10, Mo.

Lebanese D.Mag. Lebanese Dental Magazine. Rue Béchara El-Khoury, Im. Gaumont Palace, Beyrouth, Lebanon.

Logos Logos, Bulletin of the National Hospital for Speech Disorders. 61 Irving Pl., New York 3, N.Y.

M.Mundi Medicamundi, Quarterly Journal on Medical Science. Eindhoven, The Netherlands.

M.News Medical News. 130 E. 59th St., New York 22, N.Y.

M.Technicians Bul. Medical Technicians Bulletin. Armed Forces Medical Publication Agency, 23rd & E Sts., N. W., Washington 25, D. C.

Massachusetts D.Soc.J. Massachusetts Dental Society Journal. 227 Commonwealth Ave., Boston 16, Mass.

Med.Exper.,Basel Medicina Experimentalis, International Journal of Experimental Medicine, Arnold Böcklinstrasse 25, Basel, Switzerland.

Med.Klin. Medizinische Klinik. Urban & Schwarzenberg, Munich 15, Germany.

Medizinische Die Medizinische. Schloss Strasse 20, Stuttgart 1, Germany.

Méd.tropic. Médecine tropicale. École Santé Coloniale, Parc du Pharo, Marseilles 7, France.

Mil.Med. Military Medicine. Suite 718, New Medical Bldg., 1726 Eye St., N. W., Washington, D. C.

Minerva chir. Minerva Chirurgica, Corso Bramante 83, Turin 314, Italy.

Modern Med. Modern Medicine. 84 S. 10th St., Minneapolis, Minn.

Mschr.Kinderhk. Monatsschrift für Kinderheilkunde. Reichpietschufer 20, Berlin W 35, Germany.

München.med.Wschr. Münchener Medizinische Wochenschrift. Paul Heyse Strasse 26, Munich 15, Germany.

Nature Nature. Macmillan & Co., Ltd., St. Martin's St., London W.C.2, England.

Naturwissenschaften Die Naturwissenschaften. Jennerstrasse 21, 20b Göttingen, Germany.

Nederlands Tandarts. Nederlands Tandartsenblad. Prins Hendrikklaan 16, Zeist, The Netherlands.

Neue Zürcher Ztg. Neue Zürcher Zeitung. Falkenstrasse 11, Zurich 8, Switzerland.

New England J.Med. The New England Journal of Medicine. 8 Fenway, Boston 15, Mass.

New Scientist The New Scientist. Cromwell House, Fulwood Place, High Holborn, London W.C.1, England.

New York State D.J. New York State Dental Journal. Room 219, 268 Ashland Place, Brooklyn 17, N.Y.

New York State Dept.Health Bul. New York State Department of Health Bulletin. Albany 1, N.Y.

New Zealand D.J. New Zealand Dental Journal. Lister Bldg., Victoria St. E., Auckland C.1, New Zealand.

Nord.med. Nordisk Medicin. Sturegatan 16, Stockholm 5, Sweden.

North-West Den. North-West Dentistry. 2642 University Ave., St. Paul 14, Minn.

Northwest.Univ.Bul. Northwestern University Bulletin. 309 E. Chicago Ave., Chicago 11, Ill.

Nutrit.Rev. Nutrition Reviews. 99 Park Ave., New York 16, N. Y.

Odont.Tskr. Odontologisk Tidskrift. Erik Dahlbergsgatan 9, Göteborg C., Sweden.

Oral Surg.,Oral Med.& Oral Path. Oral Surgery, Oral Medicine and Oral Pathology. C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, Mo.

Österr.Zschr.Stomat. Österreichische Zeitschrift für Stomatologie. Währinger Strasse 25a, Vienna 9, Austria.

Panminerva med. Panminerva Medica, The Journal of the Italian Medical Association. Corso Bramante 83-85, Turin, Italy.

Parodontol.,Zürich Parodontologie. Imprimerie Berichthaus, Zwingliplatz 3, Zurich, Switzerland.

Parodontopathies Les Parodontopathies, Reports and Communications of the 15th Congress of the ARPA Internationale. University of Geneva, Switzerland.

Pennsylvania D.J. Pennsylvania Dental Journal. 217 State St., Harrisburg, Pa.

Pharmazie Pharmazie. Volk und Gesundheit. Neue Grünstrasse 18, Berlin C 2, Germany.

Plast.& Reconstr.Surg. Plastic & Reconstructive Surgery. Williams & Wilkins Co., Mt. Royal & Guilford Aves., Baltimore 2, Md.

Pol.med.hist.& sc. Polish Medical History and Science. 2424 N. Kedzie Blvd., Chicago 47, Ill.

Pol.Przegl.radiol. Polski Przeglad Radiologiczny. Ulica Chocimska 22, Warsaw, Poland.

Pract.D.Monogr. Practical Dental Monographs. 200 E. Illinois St., Chicago 11, Ill.

Prakt.zubní lékař. Praktické zubní lékařstvi. Sokolovská 15, Prague 10, Czechoslovakia.

Probl.Oncol.,Leningrad Problems of Oncology. Institute of Oncology of the Academy of Medical Sciences of the USSR, Leningrad, USSR.

Proc.Inst.Med.Chicago Proceedings of the Institute of Medicine of Chicago. 86 E. Randolph St., Chicago 1, Ill.

Proc.kon.nederl.Akad. Proceedings Koninklijke Nederlands Akademie van Wetenschappen. Voorburgwal 68, Amsterdam, The Netherlands.

Proc.Mayo Clin. Proceedings of the Staff Meetings of the Mayo Clinic. Rochester, Minn.

Proc.Roy.Soc.Med. Proceedings of the Royal Society of Medicine. 1 Wimpole St., London W. 1, England.

Proc.Soc.Exper.Biol.& Med. Proceedings of the Society for Experimental Biology and Medicine. 104 Liberty St., Utica, N. Y.

Pub.Health,London Public Health. Journal of the Society of Medical Officers of Health. 7-8 Henrietta St., London W.C.2, England.

Pub.Health Rep. Public Health Reports. Public Health Service, Health, Education, and Welfare Bldg., Washington 25, D. C.

Quart.Nat.D.A. Quarterly of the National Dental Association. P.O. Drawer O, Tuskegee Institute, Ala.

Quintessenz Die Quintessenz der zahnärztlichen Literatur. Stallupöner Allee 18, Berlin-Charlottenburg, Germany.

Radiol.Austriaca Radiologia Austriaca, Weihburggasse 27, Vienna 1, Austria.

Radiol.med.,Torino Radiologia medica. Corso Bramante 83, Turin, Italy.

Radiology Radiology. 713 E. Genesee St., Syracuse 2, N.Y.

Rass.trim.odont. Rassegna trimestrale di Odontoiatria. Viale Galgi 14, Pavia, Italy.

Rev.A.D.Mexicana Revista de la Asociación Dental Mexicana. Sinaloa No. 9, 3er. piso, Mexico D.F., Mexico.

Rev.A.odont., Argentina Revista de la Asociación Odontológica Argentina. Junin 959, Buenos Aires, Argentina.

Rev.A.Paul.Cir.Dent. Revista da Asociacão Paulista de Cirurgiões Dentistas. Avenida São João, 126-Sabre-loja, São Paulo, Brazil.

Rev.Belge Sci.dent. Revue Belge de Science Dentaire. Krijgslaan 10, Ghent, Belgium.

Rev.dent.Chile Revista Dental de Chile. Casilla 2573, Santiago de Chile, Chile.

Rev.dent.,Puerto Rico Revista dental. Box 185, Yauco, Puerto Rico.

Rev.españ.estomat. Revista Española de Estomatologia. Mallorca 207, Barcelona, Spain.

Rev.franç.odontostomat. Revue française d'Odonto-Stomatologie. Maloine, 27, Rue de l'Ecole-de Médecine, Paris 4, France.

Rev.Gaúcha odont. Revista Gaúcha de Odontologia. Andradas 1727, Apto. 70, Rio Grande do Sul, Brazil.

Rev.mens.suisse odont. Revue mensuelle suisse d'Odontologie. Buchdruckerei Berichthaus, Zurich, Switzerland.

Rev.stomat.,Paris Revue de Stomatologie. Librairie Masson & Cie., 120, Boulevard Saint-Germain, Paris 6, France.

Riforma med. Riforma medica. Discesa Trinità Maggiore 53, Naples, Italy.

Riv.clin.pediat. Rivista di Clinica Pediatrica. Via Luca Giordano 13, Florence, Italy.

Riv.ital.Stomat. Rivista Italiana di Stomatologia. Calle Ballotte 4866, Venice, Italy.

Schweiz.med.Wschr. Schweizerische Medizinische Wochenschrift. B. Schwabe & Co., Basel, Switzerland.

Schweiz.Mschr.Zahnhk. Schweizerische Monatsschrift für Zahnheilkunde. Buchdruckerei Berichthaus, Zurich, Switzerland.

Science Science. 1515 Massachusetts Ave., N. W., Washington 5, D. C.

Science Digest Science Digest. 959 Eighth Ave., New York 19, N.Y.

Scient.Am. Scientific American. 2 W. 45th St., New York 36, N.Y.

Shikwa Gakuho Shikwa Gakuho. Tokyo Dental School, No. 17, Kanda-Misakicho, Chiyodaku, Tokyo, Japan.

South African M.J. South African Medical Journal. P.O. Box 643, Cape Town, South Africa.

Stoma Stoma, Zeitschrift für die wissenschaftliche Zahn-, Mund- und Kieferheilkunde. Wilckenstrasse 3, Heidelberg, Germany.

Stomat.,Bucharest Stomatologia. Strada Progresului 8, Bucharest, Romania

Suomen hammaslääk.toim. Suomen Hammaslääkäriseuran Toimituksia. Bulevardi 30 B., Helsinki, Finland.

Strahlentherapie Strahlentherapie. Urban & Schwarzenberg, Meinekestrasse 13, Berlin W 15, Germany.

Surg.Clin.N.Am. Surgical Clinics of North America. W. B. Saunders Co., 218 W. Washington Sq., Philadelphia 5, Pa.

Surg.Gynec.& Obst. Surgery, Gynecology and Obstetrics. Franklin H. Martin Memorial Foundation, 54 E. Erie St., Chicago 11, Ill.

Svensk.tandläk.Tskr. Svensk Tandläkare-Tidskrift. Nybrogatan 53, Stockholm, Sweden.

Tandlaegebl. Tandlaegebladet. Osterbrogade 4, Copenhagen, Denmark.

Tekn.Aikl. Teknillinen Aikakauslehti. Association of Finnish Engineers, Rataketu 9, Helsinki, Finland.

Temple Law Quart. Temple Law Quarterly. Faculty of Law, Temple University, Philadelphia 22, Pa.

Therap.Gegenw. Therapie der Gegenwart. Urban & Schwarzenberg, Strasse des 17. Juni 112, Berlin-Charlottenburg 2, Germany.

Tr.Roy.School Den. Transactions of the Royal Schools of Dentistry. Umeå Research Library, Umeå, Sweden.

Tschr.tandheelk. Tijdschrift voor Tandheelkunde. Jutfaseweg 1, Utrecht, The Netherlands.

Tskr.norske laegefor. Tidsskrift for den Norske Laegeforening. Inkognitogt 26 ii, Oslo, Norway.

Tufts D.Outlook. Tufts Dental Outlook. School of Dental Medicine, Tufts University, 136 Harrison Ave., Boston, Mass.

U.S.Armed Forces M.J. U.S.Armed Forces Medical Journal. 23rd & E Sts., N. W., Washington 25, D. C.

Ugeskr.laeg. Ugeskrift for Laeger, Almindelige Danske Laegeforening, Kristianiagade 12, Copenhagen Ø, Denmark.

Univ.Queensland Papers University of Queensland Papers. Department of Dentistry. University of Queensland Press, Brisbane, Australia.

Vestnik Khir.,Moscow Vestnik Khirurgii. Nevsky Pr. 28, Leningrad, USSR.

Washington D.J. Washington State Dental Journal. 612 Medical-Dental Bldg., Seattle 1, Wash.

Wien.klin.Wschr. Wiener klinische Wochenschrift. Mölkerbastei 5, Vienna 1, Austria.

Zahnärztl.Mitt. Zahnärztliche Mitteilungen, Melchiorstrasse 14, Cologne, Germany.

Zahnärztl.Praxis Zahnärztliche Praxis. Hans Cornelius Strasse 4, München-Gräfelfing, Germany.

Zahnärztl.Rundschau Zahnärztliche Rundschau. Fasanenstrasse 61, Berlin W 15, Germany.

Zahnärztl.Welt & Reform Zahnärztliche Welt und Zahnärztliche Reform. Wilckenstrasse 3, Heidelberg, Germany.

Zbl.allg.Path.path.Anat. Zentralblatt für allgemeine Pathologie und pathologische Anatomie. Eberhardstrasse 10, Stuttgart 5, Germany.

Zschr.Hyg.Infektionskr. Zeitschrift für Hygiene und Infektionskrankheiten. Reichpietschufer 20, Berlin W 35, Germany.